

APRIL 15, 1914
VOL. VII. No. 2

SINGLE COPIES, 25c.
ONE YEAR, \$1.00

THE COMMERCIAL CAR JOURNAL

Entered as Second-Class Matter at the Post Office at Philadelphia, Pa.

PACKARD TRUCKS MEAN INCREASED PROFITS IN THE MOVING BUSINESS



THE spring migration of householders presents an unusual opportunity to moving and storage companies equipped with Packard trucks.

A Packard truck will do more work at this period than any other kind of equipment. It will make your spring rush season more profitable because it will waste the least time.

A Packard truck cuts the cost of both long and short hauls. In suburban work the expense of crating and shipping may be eliminated.

A Packard truck will enable you to handle more jobs per day and reduce the average time per job to a minimum.

EIGHTY-NINE MOVING AND STORAGE COMPANIES ARE OPERATING 154 PACKARD TRUCKS IN 40 PRINCIPAL CITIES

**ASK THE MAN WHO OWNS ONE
PACKARD MOTOR CAR COMPANY, DETROIT**

LINCOLN HIGHWAY CONTRIBUTOR

PUBLISHED THE
15TH OF EACH MONTH

CHILTON COMPANY

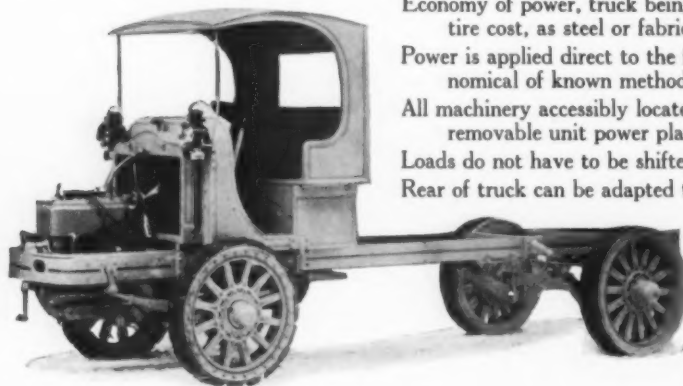
MARKET & 49TH STS.
PHILADELPHIA

Sell Trucks That Save Power

The dealer who can offer a truck which does **not** waste power has a distinct advantage over his competitors. In these days of keen competition, that question is going to loom big on the profit sheets of both dealer and user. You can protect your interests and get the bulge on your competitors by selling WALTER trucks, which, owing to their drive, are power savers.

Walter Front-Wheel Drive Truck

HAS THE FOLLOWING ADVANTAGES:



Economy of power, truck being pulled instead of pushed; phenomenally low tire cost, as steel or fabric tires can be used on the rear wheels.

Power is applied direct to the front wheels by the simplest and most economical of known methods—two enclosed spur gears.

All machinery accessibly located in the front in the form of a quickly removable unit power plant.

Loads do not have to be shifted.

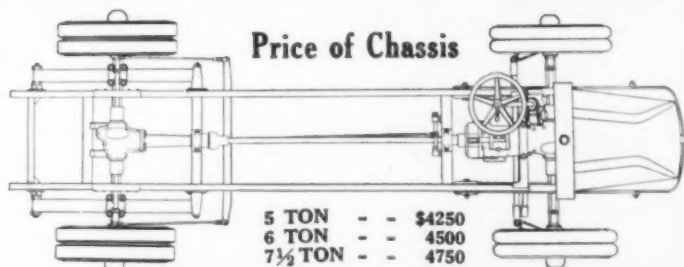
Rear of truck can be adapted to any kind of work, there being no machinery under or back of the seat, facilitating the use of long or short bodies of various types. Non-skidding a feature of front-wheel drives.

| | | |
|---------------------------|-------|--------|
| 3 TON (rear steel tires) | - - - | \$3200 |
| 3 TON (rear tires rubber) | - - - | 3400 |
| 4 TON | - - - | 3500 |
| 5 TON | - - - | 3750 |
| 6 TON | - - - | 4000 |
| 7½ TON | - - - | 4250 |

Walter Four-Wheel Drive Truck for Heavy Loads

It combines pushing and pulling and can't be stalled.

The Government specifies this form of drive for army purposes



Price of Chassis

| | | |
|--------|-----|--------|
| 5 TON | - - | \$4250 |
| 6 TON | - - | 4500 |
| 7½ TON | - - | 4750 |

Walter Tractor, Four-Wheel Drive and Steer

For tractor service nothing equals the short-wheelbase, four-wheel drive and steer truck. Can be used with trailer mounted on fifth wheel, or to haul a train of trailers. Same power plant and sterling features of construction as the other WALTER models. Price of tractors hauling up to 12 tons, \$4500.

Dealers: These three types will cover every possible demand for heavy-duty trucks and no other dealer in your vicinity will be able to offer the prospective buyer such economy of operation, such durability, such high efficiency, such **low tire cost**. This last is what interests **the buyer**. Here, Mr. Dealer, is your entering wedge for a sale.

We have some desirable territory open—it is to your financial interest to see if yours is among them. Write without delay; we'll advise you fully.

Walter Motor Truck Co., 49-51 W. 66th St., New York City



THE PUBLISHERS' PERSONAL PAGE



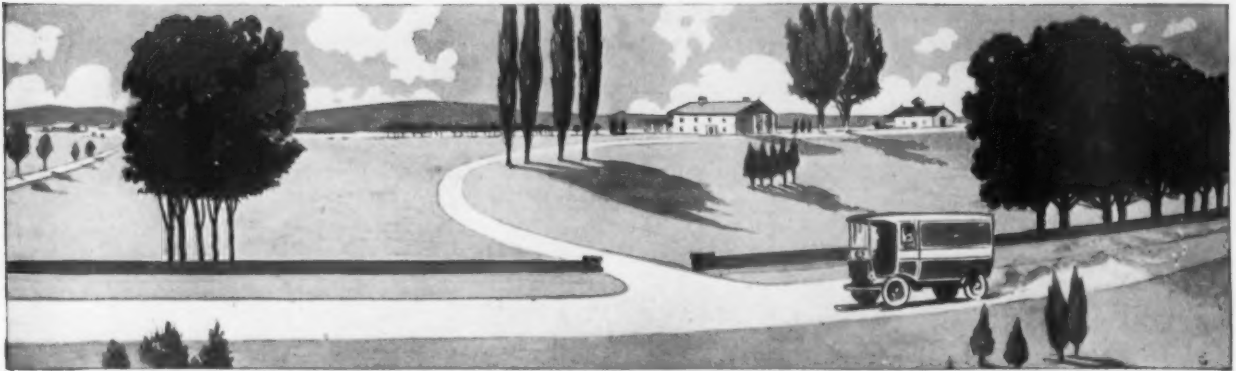
SERVICE

"Service!" The most misunderstood word in the commercial car industry to-day, means one thing to the dealer, and an entirely different thing to the user. Both use the word "service," and mean different things. Is it any wonder that agent and user cannot agree? Is it any wonder it is the rock on which many a good agency has foundered?---and the millstone which prevents further progress? Service is too often a labor without reward.

This much-maligned and misused term, "service," should be thoroughly understood by every dealer, agent and manufacturer, to say nothing of the army of users. Those in the trade, and those out of it, must soon come to an agreement as to the meaning of this small word of seven letters. Around it are grouped both success and failure; service spells either, depending upon the ability of the agent to determine of what service should consist, and also his ability to bring about the same understanding of it, in the minds of his purchasers.

An equitable and just interpretation of the word "service" can only be brought about by a thorough understanding of the problem and a general interchange of ideas on the subject. When does the dealer discover that the purchaser has a different idea of service than himself? When both, freely---and sometimes too freely---vent their heated ideas of what service really means, over a disputed bill.

Let us once understand and clearly define what service means, standardize it and educate the user to this viewpoint, and much of the trouble now connected with the service problem will have disappeared.



The Purchasing Power of Country Sections Surrounding Large Business Centers Offers Big Business Opportunities If Covered Direct by Motor Delivery Service

The Autocar

FOR BUSINESS EXPANSION

Satisfying Your Customer Insures Business Success

You Cannot Serve Your Customer to the Best Advantage Without the Use of Motor Delivery Equipment

The business man who watches today the trend of the civilization of tomorrow, and keeps abreast with the times, will realize the greatest business achievements. Modern business, according to statistics, is growing greater in the larger centers of civilization, and retrograding in the smaller centers, while the purchasing power of localities 30 to 60 miles distant from these large centers has become an enormous factor in the development of all classes of merchandise.

Prominent merchants have foreseen this condition growing, and desiring to provide individualized delivery service, have invested in Motor Delivery Vehicles which have proved far more dependable than any other vehicle of transportation. Today John Wanamaker owns 110 Autocars. They are an important factor in his service to satisfied customers. Over 1400 other concerns have rapidly followed in purchasing Autocars for prompt and efficient service. Notwithstanding, the railroads, trolleys, the R. F. D., Parcel Post, and express service, the Motor Truck is the recognized modern method of providing store service direct to the customer, and the foothold gained in making a satisfied customer today through their use, will be the foundation on which will spring the business of tomorrow.

The Autocar an Important Factor in Establishing the Value of the Motor Truck for Commercial Use

The Autocar Company specialize on one type of Motor Delivery Vehicle exclusively, they are recognized pioneer builders of gasoline cars, and are now entering upon the 17th year of marketing power vehicles. The pronounced success following their policy of building one type of vehicle, and designing the car strictly along the lines of a business conveyance, making it possible to apply a body suitable to every line of business, has proven that the Autocar type is based upon correct principles. Verify this fact by the large list of concerns, representing every line of business, who have operated Autocars for many years. The judgment of this Country's prominent concerns in buying Autocars for their business growth is unquestionably safe for you to follow.

Our new Catalog will give you some interesting information about concerns who have profited by the use of Autocars. Address department "D"

The Autocar Company, Ardmore, Pa.

ESTABLISHED 1897

MOTOR DELIVERY CAR SPECIALISTS



When Writing, Please Say—"Saw Your Ad. in the C C J"

The Commercial Car Journal

VOLUME VII

PHILADELPHIA, APRIL 15, 1914

NUMBER 2

UNITED STATES STEEL CORPORATION TO MANUFACTURE BENZOLE

United States Steel Corporation, Sharon, Pa., will erect a plant in Farrell, a suburb of that city, in which will be manufactured benzole, from the bi-products of its coke ovens. The erection of the plant will be commenced immediately, and it will be completed within a year.

Benzole is intended for use in motor cars, motor trucks and hydrocarbon engines used for stationary purposes. The use of benzole for a motor fuel is not new, it having been tried out exhaustively in France and England 6 or 7 years ago, and official tests give a higher fuel value than either gasoline or alcohol. It yields 135,000 British thermal units per United States gallon, and has a specific gravity of .889 at 0 degrees centigrade.

The United States Steel Corporation has been producing benzole for some time in limited quantities, and has been testing its products during the past year in motor cars and motor trucks. It can only manufacture benzole in cities where it has coke ovens, these being Sharon, Garry, Ind., Joliet, Ill., and Birmingham, Ala. The entry of the company into the motor fuel manufacturing field cannot be looked upon as having any serious bearing on the motor fuel world because if all the benzole available were extracted from the bi-products of the ovens, the amount would only be sufficient to supply approximately 2 per cent. of motor cars now in use. While no available figures can be obtained from the tests made by the company, it is known that the benzole can be used with the same carburetor that uses gasoline, and that the fuel is entirely successful for use in both passenger cars and motor trucks.

MOTOR TRUCK CLUB DISCUSSES BRIDGE AND TUNNEL PROJECTS

The Motor Truck Club of America, at its meeting on March 18th, went into a thorough discussion on the proposed New York-New Jersey bridge and tunnel projects. The Electric Vehicle Association of America was well represented at the meeting as were other associations interested in the improvement of street transportation. It was stated that a plan had been submitted to the legislatures of New York and New Jersey, which provides for the erection of a bridge across the Hudson River.

By a census taken in 1912, it was shown that 6,131,000 vehicles annually cross the river by ferries, and that the average time for making the trip from New York to New Jersey is 35 minutes. This time could be reduced to three or four minutes for trucks and half of that time for pleasure cars under the proposed scheme of bridging and tunneling the river.

There has been a large increase in membership since the Motor Truck Club became a national organization and a representative of motor truck users as well as members of the trade. The membership now represents an ownership of 2,319 trucks. Plans are now under way for the organization of branches in Boston, Providence, Philadelphia, Newark and Chicago.

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POST OFFICE TO OPEN BIDS FOR TRUCK SUPPLIES

The Post-office Department, Washington, D. C., will open bids on April 22nd for furnishing a quantity of supplies for the use of motor cars in the postal service during the fiscal year beginning July 1, 1914. The supplies required will include transmission and cup grease, horn bulbs, cylinder and heavy oil, blow-out and tube patches, pressure gauges, cushion and pneumatic tires, inner tubes, tire tapes, valve parts and tools, vulcanizing rubber, etc. It will be impossible to furnish estimates on the quantities required as they will be called for from time to time as the necessity may arise to equip and repair the cars owned and operated by the Department at the following places: Atlanta, Ga., two Whites; Baltimore, three Whites; Brooklyn, three Whites; Buffalo, two Whites; Columbia, S. C., one Wagenhals; Columbus, Ohio, two Wagenhals; Detroit, two Wagenhals; Louisville, two Whites; Memphis, three Wagenhals; Minneapolis, four Whites; Nashville, three Wagenhals; Norfolk, Va., two Wagenhals; Philadelphia, six Whites; Richmond, Va., two Wagenhals.

All supplies must be delivered at and within the doors of the post-offices mentioned and other offices which may be furnished with motor cars during the ensuing fiscal year.

Prospective bidders desiring application blanks and details about the above mentioned supplies can obtain them upon application to the Purchasing Agent, Post-office Department, Washington, D. C.

BRITISH FUEL PRICES

So much has been printed and published regarding the high price of gasoline or petrol in Great Britain that a word of explanation seems necessary. Prevailing retail prices in the United States at the time of writing range from 15 to 25 cents per gallon, probably averaging 20 cents. As far as we are able to learn, British retail prices average about 27 cents per gallon. This would apparently mean that John Bull pays 7 cents more per gallon for his fuel than we do, but this is not true because the British gallon is nearly 17 per cent. larger than the United States gallon, the exact figure being British gallon equals 1.2009 United States gallon. Therefore one British gallon of gasoline in the United States at 20 cents per

gallon would cost 24.018 cents. This shows that the Britisher only pays a shade under 3 cents more per gallon than we do. The British tax on petrol probably accounts for most of this increase in price.

THE INTERNAL COMBUSTION ENGINEERS' ASSOCIATION has moved from 416 W. Indiana Street, Chicago, Ill., to 1413 Michigan Avenue. The officers of the association are: President, Charles Kratsch; First Vice-president, Harry E. King; Second Vice-president, S. M. Walker; Third Vice-president, J. C. Miller; Fourth Vice-president, Albert Erickson; Fifth Vice-president, C. T. Powell; Secretary, Wallace V. Pye; Treasurer, I. J. Babcock.

UNITED STATES RUBBER COMPANY'S NET PROFITS, \$7,140,125

United States Rubber Company, New York City, has issued a report showing net profits amounting to \$7,140,125. This report covers only nine months, ending December 31, 1913, because the company has changed its fiscal year to correspond with the calendar year. During the nine months the company did a gross business of \$87,349,692; the net income, including cash discount allowed to customers, amounts to \$9,677,532. Deducting the interest on the funded and floating debt leaves a profit of \$7,140,125.

STUDEBAKER'S 1913 PROFIT NEARLY \$2,000,000

The Studebaker Corporation's report to its stockholders shows that during the calendar year 1913, the total sales amounted to \$41,464,949.82, as compared with \$35,440,327.41 in 1912. The net profits from all sources, after payment of interest, amount to \$1,772,473.65. The increase of business during 1913 over 1912 amounts to 17 per cent. and is the largest volume of business in the history of the company. The directors state that they believe the standardization of the products and the volume of sales were of more importance in 1913 than large profits, and greater business is expected for the coming year.

NEW STEWART-WARNER MANAGERS

Frank M. White, who was formerly manager of the Stewart-Warner Speedometer Corporation's New York Branch, and who for the last two years has been at their factories in Chicago, returns again to take up his duties as manager of the New York Branch. F. O. Fleischer, who has been New York manager, remains as office manager.

J. J. Hildebrecht, who has been manager of the Pittsburg Branch, has taken up his new duties as a special salesman. The new Pittsburg manager is A. T. Henderson.

Batavia Rubber Company, Batavia, N. Y., in addition to its regular dividend of 1½ per cent. on its preferred stock, has declared on the common stock a regular quarterly dividend of 1 per cent., and an extra dividend of ¾ of 1 per cent., which were payable on April 1st.

GURNEY BALL BEARING COMPANY OPENS WESTERN OFFICE

Gurney Ball Bearing Company, Jamestown, N. Y., well-known manufacturer of ball bearings, owing to the rapid growth of its business, has established an office in Detroit, where it has established an engineering department to place such service in close touch with its western customers. This office is located in Room 1935 Dime Bank Building, and is in charge of Mr. Otto Bruenauer, western sales manager.

Standard Reller Bearing's creditors met on March 27th for the purpose of receiving a report from R. S. Woodward, Jr., and S. Lawrence Bodine, receivers. It was proposed that a creditors' supervising committee of five be appointed with power to liquidate the company at any time, should such a course be desired. The assets of the company from \$6,101,107 on September 13, 1913, have shrunk to \$1,831,432; the quick assets of the company at \$792,000, and it owes approximately \$1,500,000. At the meeting the general sentiment was to give the receivers a year to put the company on its feet, and if not, to liquidate.

Gramm-Bernstein Company, Lima, Ohio, has declared its regular 3½ per cent. semi-annual dividend on the preferred stock of the company. The affairs of this company's business show a prosperous increase in the number of trucks sold, and indications point to a good and substantial growth in the business.

Pyrene Fire Extinguisher Company has created a motor car department in order that the needs of motor car users may be studied and their interests properly served. This department is now in operation under the management of C. Louis Allen, for the past year New York manager of the Service Recorder Company. It will be the aim of this department to act in the nature of a general information bureau and counsel on all matters pertaining to automobile fire insurance and the owners of both pleasure and commercial cars are cordially invited to make use of this department at all times. The fire insurance companies have recently granted a substantial reduction in their rates whenever the automobile or truck was properly equipped with Pyrene Fire Extinguisher.

Aetna Motor Truck Company, Detroit, \$100,000, incorporated to manufacture and sell trucks.

ONE HUNDRED AND FIVE TRUCKS SOLD ON ONE ORDER

What is believed to be the largest single order ever placed for motor trucks has just been received by The Kelly-Springfield Motor Truck Company, of Springfield, Ohio. This order was placed by the Pacific Motor Coach Company, of Los Angeles, California, and calls for one hundred and five Kelly-Springfield trucks.

The Pacific Motor Coach Company has been studying the motor truck field very carefully for some months past, and finally decided upon the Kelly-Springfield to standardize their large equipment. This company is capitalized at \$500,000, and will operate double decked motor buses between Los Angeles and Venice, Long Beach, Pasadena, San Pedro and other nearby points.

Thirty-three trucks on this order are for immediate delivery, and by July 1st the line will be in operation. The remainder of the order is to be delivered on a monthly schedule which will bring the entire one hundred and five into operation by January, 1915. The order calls for one hundred and four special five-ton chassis, and one two-ton chassis which will be used for the carrying of gasoline.

George Westinghouse, the famous inventor and engineer, died of heart disease at his New York City residence on March 12. His health had been failing for some time and consequently his death, though a great shock to his thousands of friends and acquaintances all over the country, was nevertheless in a measure anticipated.

Emil Groseman, Manufacturing Company, Inc., Brooklyn, N. Y., has closed its Detroit branch, and will hereafter have only a Detroit office at 708 Ford Building, in charge of G. Edward Shaw, who will also call on the factories in the States of Michigan, Indiana and Illinois.

DURANT DORT PRICES

In our February 1914 issue in the *Review of Western Commercial Cars*, we gave the prices of the Durant Dort products, the Best and Flints. These prices were for cars equipped with solid tires, pneumatic equipment being extra.

In our March 15th issue, on page 43, we gave the price of the Commerce Car as \$875. This price has been changed to \$975.

Personal Items

H. R. Brown has resigned as western division sales manager of the Thomas B. Jeffery Company, Kenosha, to join the Mitchell-Lewis Motor Company, Racine, Wis.

C. E. Stone has been elected general manager of the Motor Truck Club, New York City. E. L. Howland, who has been secretary and general manager, remains as secretary.

Chas. E. Stahl, of Chicago, has been appointed sales manager of the Connecticut Telephone & Electric Company, Meriden, Conn., manufacturers of the well-known "Connecticut" ignition products.

Chas. H. Pier, of Flint, Mich., formerly sales manager of the W. A. Peterson Company, will represent the Flint Motor Wagon Department, Durant-Dort Carriage Company, in Ohio, Indiana and Michigan.

J. M. Evans, who has been representing the Flint Motor Wagon Department, Durant-Dort Carriage Company in Ohio, has been transferred to eastern Pennsylvania, with headquarters in Reading.

Geo. E. Shaw, formerly factory representative of the Emil Grossman Manufacturing Company, Inc., Brooklyn, N. Y., has been appointed western manager with headquarters in the Ford Building, Detroit.

R. J. Schmunk, for several years sales manager and for the past year director of sales of the Peerless Motor Car Company, has become general sales manager, the company's chief executive of the selling division.

G. D. Wilcox, formerly sales manager of the Standard Motor Truck Company of Detroit, Mich., has accepted a similar position with the Commerce Motor Car Company, of Detroit, well known makers of the Commerce commercial car.

J. L. Bergs, formerly sales manager and superintendent of the Johnson Truck factory in Milwaukee and sales manager of the Fritchie Truck factory in Denver, has joined the sales force of the General Motors Truck Company.

Arthur C. Gross, formerly city salesman for the Kenton Harman Company, has joined the sales force of the Flint Motor Wagon Department, Durant-Dort Carriage Company, and will travel through western New York State, with headquarters in Rochester.

R. P. Spencer, one of the most widely known men in the country in both sales and advertising, has been appointed sales manager of the Federal Motor Truck Company.

Arthur Waterman has recently returned to the Hartford Suspension Company to fill the place vacated by Mr. Reeves. Mr. Waterman had been associated with the Hartford interests for many years and had been a great factor in building up the business until it became the largest in its class in the world. He has for the past year been sales manager for the G. C. Vaporizer Company, and now returns to his old duties with the added distinction that he becomes vice-president and general manager, practically assuming complete control of the business.

William J. Slater, formerly assistant sales manager of the Michigan Motor Car Company, has joined the Flint Motor Wagon Department, Durant-Dort Carriage Company, as general salesman, with headquarters in Flint. He will cover the United States in a general way.

Gilbert Woodill, formerly sales manager of the Hawley-King Company, Los Angeles, Cal., who has had charge of the distribution of Oakland cars in that section, has become sales manager of the W. K. Cowan Company, in charge of the distribution of Jeffery cars in southern California.

W. C. Knight, formerly manager of the Warner Instrument Company in Cincinnati and Indianapolis, and for the past year with the Stewart-Warner Company in Detroit, has become western sales manager for the Boston Auto Gage Company, of Boston, Mass., with offices at 1231 Woodward Ave., Detroit, Mich.

Walter G. Clark, efficiency expert and consulting engineer, of New York City, is now in Los Angeles, to install a system for the Motor Truck & Terminal Company, which now operates forty-seven trucks and has ordered forty more for use in competition with the railroads within a radius of 50 miles of Los Angeles.

Manning J. Smith, treasurer of the L. H. Gilmer Company, Philadelphia, Pa., owing to ill health, has given up his duties temporarily. At the last meeting of the directors, John S. Krauss was elected secretary and factory manager. G. Walker Gilmer, formerly connected with the company, has returned and assumed the work of sales manager in the absence of Mr. Smith.

Kramer Governor Company, Milwaukee, Wis., has been organized by Benj. G. Kramer, President of the B. G. Kramer Company, with a capitalization of \$25,000 for the purpose of manufacturing governors for motor trucks. Headquarters have been established in the present Kramer works on Lake Street.

The Thurber Rotary Starter Company, well-known maker of the rotary air starter for automobiles, has been taken over by the Northern Engineering Works, 685 Atwater Street, Detroit, Mich. This company now proposes to manufacture and market these starters, and is arranging a vigorous advertising campaign on same.

Cleveland-Galion Motor Truck Company has been taken over by the Galion Dynamic Motor Truck Company, recently incorporated with a capitalization of \$250,000. The incorporators of the company are: G. W. Nickels, N. G. Knight, Chas. Schaefer, J. B. Holmes, John J. Bittner, Harry B. Greig and John M. Deibig.

Model Gas Engine Works, Peru, Ind., has been bought by the Pittsburgh Model Engine Company, capitalized at \$750,000. A new factory is being erected in Pittsburgh, and the Peru plant will be operated as a branch of the Pittsburgh plant. The officers of the new company are: W. J. Strassburger, President; E. A. Myers, Vice-President; J. F. Keenan, Treasurer; J. W. Littlejohn, Secretary. The Pittsburgh plant will be ready for operation about July.

INTERNATIONAL MOTOR HAS NEW SALES AND EXECUTIVE OFFICES

The Executive and Sales offices of the International Motor Company have recently moved from their old quarters at 57th Street and Broadway, to larger quarters in their modern and finely equipped eight-story service building at 63rd Street to 64th Street on West End Avenue, New York City.

The Company manufactures the Mack, Saurer and Hewitt trucks, which are used all over the country. The erection of their service building with its excellent facilities and equipment, considered to be the finest in the United States, is an evidence that this company intends to be an important factor in the motor truck trade for some time to come. Repair business can be taken care of here more economically, because of the facilities and machine equipment, which includes compressed air, telpherage, electric plugs every 20 ft. for electric drills, etc. The machine shop in its fullness would be a credit to a modern factory. The company has its own radiator department, blacksmith shop, painting and body departments, etc., in fact is so fully equipped that trucks can be constructed from the wheels up if necessary. The forges and blacksmith shops are placed on the roof, which is a novel location and renders more positive the fireproof safety of the rest of the building. Every floor is protected with a sprinkler system, and is so arranged that in case of fire it can be completely cut off from other levels. The boiler and engine rooms are under the main roof but are really in a separate building, it being necessary to go outside the main walls to enter the fire rooms.

Enormous space is utilized for gasoline garaging purposes, and lately an electric charging station has been added to take care of the increased demand for such service.

Murphy-Potter Company, Detroit, Mich., has changed its name to the Brass & Aluminum Foundry & Machine Company. Wm. E. Carpenter, for the last three years sales manager of the company, has become general manager.

The Norma Company of America, maker of Norma ball, roller, thrust and combination bearings, announces the removal of its offices, from 20-24 Vesey Street, to 1790 Broadway, New York City.

The Foxboro Company, Foxboro, Mass., has taken over the liabilities and assets of the Industrial Instrument Company, of Connecticut, which was a holding company, and of the Standard Gauge Manufacturing Company, of Connecticut, with a factory at Foxboro. The Foxboro Company manufactures a rapidly growing line of Foxboro Improved Recording Gauges, Thermometers, Tachometers and Pyrometers, which are sold by the Industrial Instrument Company. The Foxboro Company owns all the capital stock of the Industrial Instrument Company, and there will be no change in the personnel and policies of the companies.



POPULAR EASTERN MOTOR TRUCK SPECIALISTS TAKE NEW CHICAGO QUARTERS

Through its Chicago branch, the Autocar Company, of Ardmore, Pa., doing business as the Commercial Car Sales and Service Co., has leased new premises at 735-755 West Jackson Boulevard as sales and service headquarters. Heretofore, the Autocar Company's Chicago home has been at 918 South Michigan Avenue, upon the outer fringe of Chicago's automobile district. Michigan Avenue has for years been the theatre of activities of Chicago's automobile men, and the business has grown so rapidly that well-established automobile concerns may be found as far out as Twenty-fifth Street, a distance of about three miles from the center of the city.

The step now taken by the Autocar Company is looked upon as a bold one, and it is the first motor truck concern to leave the automobile district to locate in a new and untried field. This choice, however, marks the trend of the industry in keeping in close proximity to business houses. Jackson Boulevard is the only important thoroughfare, minus car tracks, from the loop district to the very rapidly growing west and northwest portions of the city, and it is therefore the chief thoroughfare for pleasure cars and trucks.

The new Autocar Sales & Service Building is situated on Jackson Boulevard below Halsted Street. The building is 150 ft. deep, running through to Boston Avenue, a street 66 ft. wide. This provides the premises with a very commodious garage entrance, the front of the building being devoted to sales purposes. The famous "loop" district can be reached in three or four minutes, and the important and rapidly growing business districts to the north, west and south can be reached without traversing the congested loop district. The new station will be within a stone's throw of Chicago's wholesale district and few, if any, of Chicago's more important houses are more than a mile from this location.

Altogether, it may be questioned if it would be possible to secure a location better fitted to serve the needs of a growing clientele of Autocar truck users, and there are not indications wanting that other important truck concerns, recognizing the meaning of this move on the part of the Autocar Company, will follow them to Jackson Boulevard, and that this Boulevard will in the near future become the center of Chicago's automobile truck trade.

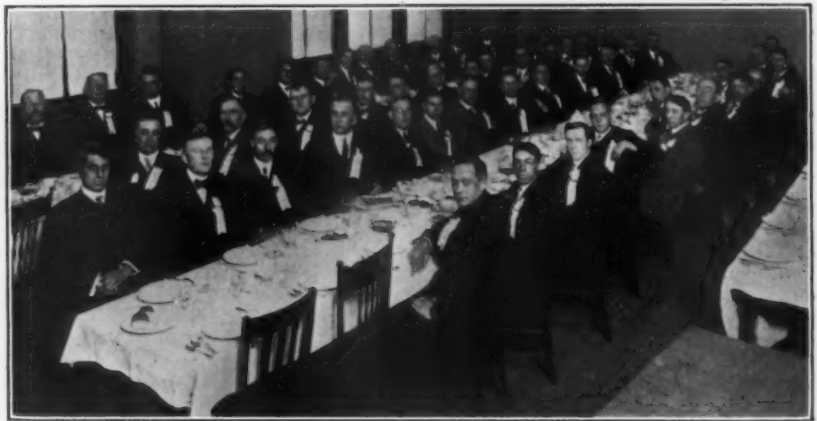
The new building is a handsome structure, three stories high, with basement, having a facade of glazed brick. The store front will be remodeled and will present a very handsome and attractive appearance. The show room will have a depth of 60 ft. Columns will be encased in plaster, and

the floor will be covered with art tiling. A new 8-ton elevator, 8 ft. 6 in. x 23 ft., will be installed and the garage will be provided with every feature known for the economical and efficient handling of trucks. The washstands will be so arranged that any car can be washed and run back into its permanent storage location with but one movement.

A 1000-gal. capacity gasoline tank will be sunk adjacent to the building line on the company's new premises, and this tank will be equipped with pumps of the very latest pattern. An oil storage house, distinct from the main structure, will be erected so that the danger of fire will be minimized. The building will be equipped throughout with a sprinkler system.

The repair shop will be of the most modern pattern, and there will be upon the same floor a steam room for the quick and thorough cleaning of chassis and parts and for removing carbon from the cylinders by the new oxygen flame method, and a separate, enclosed, well-equipped forge room will also be provided. A large stock of parts will always be carried in a well-lighted and well-arranged stockroom, equipped with every facility for handling and recording parts sales transactions.

The floors are well lighted and have the advantage of exceptional head room, no ceiling being less than 16 ft. above the floor. In addition, the building has a fine basement extending under the pavement. The dimensions of the building are 150 x 50 ft. This gives a floor space of 30,000 ft., as against 6000 at the present Michigan Avenue location.



Illinois Dealers Who Visited the White Factory

Fifty Illinoisans, traveling in private cars, recently made a flying trip to Cleveland to inspect the factory of The White Company, and the methods of production. When they arrived at the Union Depot, at 7.30 o'clock in the morning, they were met by officials of The White Company, and a fleet of seven-passenger touring cars conveyed them to the Union Club for breakfast, as guests of The White Company. The whole day was spent at the White plant, including luncheon in the administration dining room, and in the evening the visitors were dined at the Cleveland Athletic Club. After the banquet they were entertained at the Hippodrome, and were returned to Union Depot to depart in the same cars in which they arrived.

Agency and Branch Items

H. V. Lansdale, Washington, D. C., has secured the agency for the Reo trucks.

Autocar Sales and Service Company is now established at 1311 Cathedral Street, Baltimore, Md.

Dunbar Motor Company, of Springfield, Mass., has taken the Hampden and Hampshire County agency for G. M. C. trucks.

Boss Rubber Company, Denver, Colo., distributor of Motz tires in Colorado, has opened branches in Pueblo and Colorado Springs.

Motz Tire & Rubber Company, Akron, Ohio, has established the following distributing agencies: Electric Garage, Fort Wayne, Ind.; Gietle Brothers, Springfield, Ill., and the South Bend Rubber Company, South Bend, Ind.

F. T. Sanford Automobile Company has taken over the representation of the Kelly Springfield motor trucks for New York State, New Jersey and Connecticut. Local agents are being appointed in the principal towns and cities in the States named.

United States Mill Supply Company, of Providence, will open a branch in Boston as distributors of Mais trucks. Mr. Walter L. Mitchell, previously connected with Mack Motor Truck Company and Packard Motor Car Company, to become manager.

Commercial Car Sales & Service Company, 918 Michigan Avenue, Chicago, Ill., has moved to 753 W. Jackson Building. This company is a branch of the Autocar Company, Ardmore, Pa.

AGENCY OPPORTUNITIES

[In this section, each month will be listed the open territory of leading commercial car manufacturers. This affords an opportunity for dealers or those wishing to take on agencies, to learn which makers are seeking agents in their vicinity.—EDITOR.]

Crown: Crown Commercial Car Company, Milwaukee, Wis. Open territory in New York City, Boston, Philadelphia, Buffalo, San Francisco, Los Angeles and other principal cities.

Crawford: Crawford Automobile Company, Hagerstown, Md. Open territory in New England, Northern New York, Central Pennsylvania, Middle West and Northwest and Southern California.

Trabold: Trabold Truck Manufacturing Company, Johnstown, Pa. Open territory in Pennsylvania except Cambria, Somerset, Blair and Indiana counties.

Koehler: H. J. Koehler Sporting Goods Company, 1709 Broadway, New York City. Open territory in San Francisco, Oregon, Nebraska, Atlanta, Ga., New Orleans, La., Galveston, Tex.

Mercury: Mercury Manufacturing Company, 4110 S. Halstead Street, Chicago, Ill. Open territory in St. Paul and Minneapolis, Minn., Milwaukee, Wis., St. Louis, Mo., Cincinnati, Ohio.

Bessemer: Bessemer Motor Truck Company, Grove City, Pa. Open territory in Texas, Oregon, Washington, Georgia, Alabama, Kansas, New York City, Baltimore, Md., St. Louis, Mo., Cincinnati, Ohio.

Conventions of Interest to the Trade

National

April 22-25—at Savannah, Ga. Convention of National Drainage Congress. Edmund P. Perkins, Chicago, Ill., President.

April 29-30—at Boston, Mass. National Association of Cotton Manufacturers. Edwin Farnham Greene, President.

May 18—at Indianapolis, Ind. Convention National Retail Hardware Association. M. L. Corey, Secretary, Argos, Ind.

June 12-19—at Toledo, Ohio. National Convention of Woodmen. Edw. C. Frank is chairman of the committee of arrangements.

June 17-19—at Minneapolis, Minn. National Wholesale Grocers' Association of the United States. Headquarters at Hotel Radisson. Oscar B. McGlason, President; Mr. Beckman, Secretary; J. W. Bragdon, Minneapolis, and H. Huntington, Stillwater, are interested.

June 18-19—at Buffalo, N. Y. National Hardwood Lumbermen's Association, Hotel Statler. Arthur W. Kreinheder, President of the Buffalo Lumber Exchange, is interested.

July 7-9—at New York City. Annual Convention of National Leather and Shoe Finders' Association. Merchants' Association will probably prepare for the event.

October—Louisville, Ky. National Convention of the Kentucky Bottlers' Association to be held in the Armory. Samuel Leidigh is President of both the State and National Associations.

State Conventions and Fairs

April 20-21—at Mobile, Ala. Tri-State Laundrymen's Association, Hotel Cawthorn.

April 23—at Orange, N. J. Master Builders' Association of New Jersey. V. P. Christofferson, of Perth Amboy, is Secretary.

May 5-7—at Montgomery, Ala. Alabama Retail Hardware Association. Business Men's League committee is preparing for the event.

May 5-7—at Little Rock, Ark. Retail Hardware Association of Arkansas, to convene in this city. Grover T. Owen, of this city, is Secretary.

May 6-7—at Gainesville, Fla. Florida State Retail Hardware Dealers' Association. Board of Trade may be addressed.

May 26-27—at New York City. Board of Governors of the American Manufacturers' Association will hold convention. Merchants' Association will probably have charge of the event.

Hart, H. S., and Rowland Thomas, of Reading and Allentown, Pa., have formed a selling arrangement whereby they have taken over the distribution of the Flint Motor delivery wagon in eastern Pennsylvania, having service station arrangements with Mammoth Garage, Reading, Pa., Lafayette Garage, Easton, Pa. and Bachman, Bradbury & Bachman, Allentown, Pa.

Kirk's Garage, 219 Brown Street, New Haven, Conn., has taken the agency for the Baker electric. An electric service station has been added to the garage where proper attention will be given to all makes of electric cars. This department is under the supervision of H. H. Morrell.

The list of conventions given herewith is published each month so that commercial car manufacturers can communicate with the proper authorities with the idea of arranging to give lectures, illustrated talks, statistics, etc., to show the advantage of motor trucks in these various lines; also possibly to show and demonstrate their cars.

May 26-28—at Kansas City, Mo. Kansas Grain Dealers' Association. Commercial Club may be addressed.

June 1-6—at Topeka, Kans. Topeka Retail Grocers' Association will hold pure food show. Committees are making preparations for show.

June 9—at Clarksburg, W. Va. West Virginia Business Men's Association to hold annual meeting.

June 16-17-18—at Des Moines, Ia. Iowa Retail Merchants' Association will hold annual convention.

June 17-19—at Isle of Palms, Charleston, S. C. Southern Wholesale Grocers' Association. J. N. McLaurin is President.

June 23-25—at Galveston, Tex. Retail Merchants' Association of Texas. H. A. Eiband, President.

July 7-9—at Raleigh, N. C. Retail Hardware Association of Carolina. T. W. Dixon, of Charlotte, N. C., is Secretary.

July 14-16—at Cedar Point, Ohio. Ohio Retail Grocers' & Meat Dealers' Association to hold 15th annual convention.

August 11-14—at Eldon, Ia. Big Four Fair Association will hold fair.

August 26-Sept. 3—Iowa State Fair. Association is preparing for event.

August 31-Sept. 5—at Santa Rosa, Cal. District Agricultural Fair to be held. Directors of the Chamber of Commerce are preparing for event.

September 15-18—at Allison, Ia. Butler County Agricultural Association will hold annual fair.

September 15-18—at Milton, Ia. Milton District Agricultural Association Fair.

September 16-19—at Batavia, N. Y. Genesee County Fair to be held.

September 21-26—at Decatur, Ala. North Alabama Fair to be held. James H. Stone, of New Decatur, is Secretary of the organization.

September 21-26—at Sioux City, Ia. Fair of the Interstate Fair Association.

September 22-25—at Rhodes, Ia. Eden District Agricultural Association Annual Fair.

October 1-3—at Oakland, Md. Garrett County Agricultural Association Second Annual Fair.

October 12-17—at Birmingham, Ala. Alabama State Fair to be held. Sam Fowlkes, Secretary of the Alabama Fair Association, is preparing for event.

October 13-16—at Harrisonburg, Va. Rockingham County Fair. Extensive arrangements are being made.

October 20-24—at Hope, Ark. Hempstead County Fair. W. W. Thorp, Secretary.

November 7-13—at Macon, Ga. Georgia State Fair. Harry C. Robert is Secretary and general manager.

December 1-4—at Des Moines, Ia. Convention of Iowa Retail Implement and Vehicle Dealers' Association. Commercial Club is interested.

Firemen Conventions

May 12-14—at Oklahoma City, Okla. Chamber of Commerce may be addressed.

June 17-18—at Napoleon, Ohio. Northwestern Ohio Volunteer Firemen's Association. T. W. Fisher, Secretary.

July 28-29—at Bath, N. Y. Western New York Volunteer Firemen's Association. Charles Kant, of Lockport, Secretary.

July 29-31—at Chambersburg, Pa. Cumberland Valley Volunteer Firemen's Association. Chambersburg fire department has charge of preparations.

August—at Geneva, N. Y. State Firemen's Association. Albert B. Leonard, Secretary, is preparing for event.

October—at Harrisburg, Pa. State Firemen's Convention.

October 20-23—at New Orleans, La. International Fire Chiefs' Association to convene. Chief Louis Pujol preparing for event.

G. V. Lyons has been appointed manager of the San Francisco branch of the Moreland Motor Truck Company.

W. G. Penfold, formerly general manager of the Buffalo Electric Vehicle Company, is now manager of the Buffalo branch of the Detroit Electric Company.

Stewart Warner Speedometer Corporation, Chicago, Ill., has opened the following service stations: Schmidt Company, 90 Albert Street, Winnipeg, Man., Canada; El Paso Speedometer Service Station Company, 315 Texas Street, El Paso, Tex.; Scranton Speedometer Service Station Company, Scranton, Pa.

Holihan Manufacturing Company has been organized and has taken over the plant formerly occupied by the Anguish Manufacturing Company, 1506 West Fort Street, Detroit, Mich. This company makes a specialty of radiators, hoods, fenders, gasoline tanks, and also repairs all kinds of radiators. James A. Holihan, president and general manager, has had a wide experience, having been assistant general manager of the Briscoe Manufacturing Company. The other officers are: Wm. Christian, Secretary and Treasurer; L. Goldsmith, Vice-President; and the other directors are Chas. R. Talbot and Sherwin A. Hill.

CCJ GALLERY of SALES MANAGERS

THE WHEEL
OF GOOD
FORTUNE
FOR
TRUCK
USERS



WILL BROWN
BROWN TRAFILOG CO.
CLEVELAND, OHIO

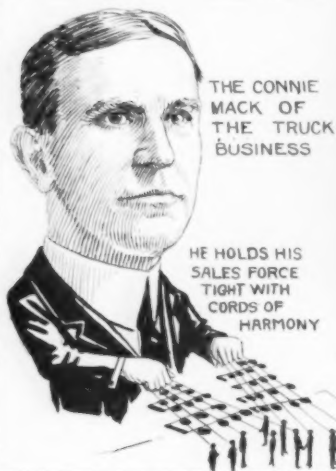
THE TRAFILOG SAYS,
FRIEND WILL BROWN
KEEPS TABS ON TRUCKS ALL OVER TOWN
NO WHEEL OF FORTUNE CAN COMPARE
FOR EVERY TURN IS NOTED THERE
AND IF THE DRIVER "HITS A BEER"
AND TRIES TO HAND YOU SOMETHING QUEER
YOU'LL FIND HIM OUT AND PROVE TO HIM
HIS CHANCE FOR LIES IS RATHER SLIM



NO WONDER
HE SELLS
GOOD SPRINGS
HE IS VERY
CLEVER
WITH HIS
IRONS, DONT
YOU KNOW



C.N. PEACOCK
CLARENCE N. PEACOCK & CO
NEW YORK



THE CONNIE
MACK OF
THE TRUCK
BUSINESS

HE HOLDS HIS
SALES FORCE
TIGHT WITH
CORDS OF
HARMONY



EDWARD A. KINGSBURY
GEN. SALES MANAGER
CHASE MOTOR TRUCK CO.
SYRACUSE, N.Y.

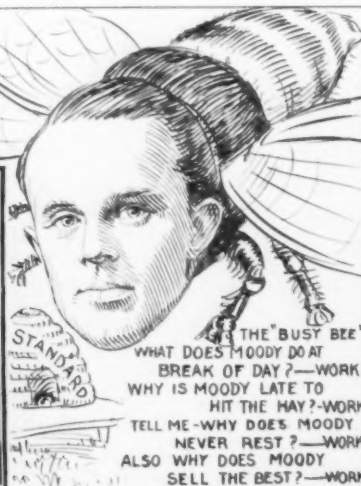
SAFE, SILENT, EFFICIENT
HINDLEY WORM GEARS AND
H. FLECKENSTEIN
SALES MGR.
PHILADA. PA.



SATISFIED CUSTOMERS



C.W. MOODY
STANDARD
MOTOR TRUCK
CO OF OHIO
CLEVELAND



"THE BUSY BEE"
WHAT DOES MOODY DO AT
BREAK OF DAY?—WORK!
WHY IS MOODY LATE TO
HIT THE HAY?—WORK!
TELL ME—WHY DOES MOODY
NEVER REST?—WORK!
ALSO WHY DOES MOODY
SELL THE BEST?—WORK!

THE SUN NEVER
SETS ON THIS
DEAR OLD RAG

"IT'S ENGLISH
YOU KNOW"



AND THIS
IS ANOTHER SON
THAT NEVER SETS
C.J. FITZPATRICK
SALES MGR.
CLEVELAND WORM
& GEAR CO.
CLEVELAND OHIO

THE COMMERCIAL CAR JOURNAL

Vol. VII.

PHILADELPHIA, APRIL 15, 1914

No. 2

Published the 15th of each month by the

CHILTON COMPANY

Market and 49th Streets

Philadelphia, U. S. A.

JAMES ARTMAN President
 GEO. H. BUZBY Vice President
 C. A. MUSSELMAN Treas. and Gen'l Manager
 A. H. VAUX Secretary

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SUBSCRIPTION RATES

United States and Mexico One Year, \$1.00
 Other Countries in Postal Union, Including Canada One Year, \$2.00

Make checks, money orders, etc., payable to Chilton Company.

Change of Address—Subscribers desiring their address changed, should give the old as well as the new

Entered as second-class matter at the Post Office at Philadelphia, Pa.,
 under the Act of March 3, 1879.

A PLEA FOR THE SMALL CAR



IT HAS taken the better part of ten years for the commercial car manufacturers to realize the importance and the advantages of small capacity units. The increasing number of commercial cars being placed on the market with capacities from 1000 to 2000 lbs, is proof that the manufacturers now recognize the demand for commercial cars of this type. A very few appreciate that there is also a demand for cars with capacities as low as 500 lbs.

How unfortunate it has been for the commercial car industry that the beginnings were not with small, inexpensive units. There were too many costly experiments by early users, with enormous trucks, with enormous upkeep expenditures. These experiences were dear not only to the individual users, but to the commercial car industry, and to-day we are experiencing in some measure a reaction, one of the causes of which is the above mentioned costly experiences with very large trucks at the beginning.

The salesman who is in close touch with the buyer is aware of these facts, and occasionally encounters even to-day bitterness and rancor against the truck as a direct result of an early siege with a too large and too costly outfit.

Aside from the incompetence of the early drivers, and we might say of some of the present drivers, the size and cost, not only the initial cost, but the upkeep cost of the trucks is

one of the most potent factors acting against their universal adoption.

Each year an increasing number of the new vehicles are of the small unit type, and each year as the production of the country increases the proportional part represented by the large units falls off.

Still there are not enough small low priced commercial cars that will stand up and do the work. The demand for these vehicles is many times as great as for five, six, seven and one-half, and ten-ton trucks, yet the makers as a whole look upon such small cars as beneath the dignity of a large firm to manufacture. In truth some of them do not even deign to consider them as commercial cars. They little realize the enormous number of business houses that could use to advantage such trucks, nor do they recognize the fact that the man who begins with a small vehicle of low initial cost and even lower service costs, is being trained in the use of motor-driven vehicles at a minimum of expense, and that he comes out a satisfied graduate, ready to use larger units where necessary. He has passed then no heartrending and embittering experiences in the use of power delivery during the formative period of his knowledge of such modern methods. He is ready, and receives cordially, advances from truck salesmen even those selling larger units and becomes eventually a satisfied user.

How different with the man who begins with a five or six-ton truck, and found to his sorrow that it was not a paying proposition. Don't let us be misunderstood at this point. The thought is not conveyed that his conclusion was correct or that his experience was due to the inefficiency of the truck, although it might occasionally have been. We wish to bring out the point that even though due to the ignorance and inability of the owner himself, the results are the same, the experience was to him proof that trucks were not economical and could not be used to advantage in his business. He clings persistently, tenaciously even to that thought for years afterward. It has actually taken years for good trucks to live down such reputations. This time has not yet passed, beginners with trucks are repeating over and over again the same history day by day; beginners with great big machines which never should have been placed in service as a first installation. Equipment which should not have been sold if the salesman actually knew his business and understood that of his prospect. We might also add and knew the temperament and disposition of the prospect, for these have much to do with his ultimate judgment on whether the truck is a money maker or a money loser.

Manufacturers, sales agents, and salesmen are alike responsible for many unsatisfactory conditions which exist in 1914 in the truck industry. The knowledge of the causes underlying these conditions is gradually reaching the consciousness of those most vitally interested, and there should be but one result, namely the manufacture and sale in larger and larger quantities of smaller and smaller commercial cars.

By small and inexpensive units we do not mean cheap and ineffective units. The 500-lb. to 1000-lb. capacity delivery wagon must be as staunch as its big brother the 5-ton to 20,000-lb. truck.

This year marks the beginning in the commercial car industry of such staunch and efficient low priced trucks. At the same time it points out with just as unerring a finger a change for the better, a settling down of the industry onto a business basis. It should indicate to the manufacturer, the dealer and the user, that he study the small capacity unit with more serious thought, and recognize before it is too late the important place which it is destined to occupy.

LARGE FIELD FOR LIGHT DELIVERY VEHICLES



THE evolution of a cyclecar from the motorcycle is apparently going to follow the same course that the evolution of the automobile did from the carriage, that is laboriously step by step, many of the steps being backward. These will of course have to be retraced to bring the vehicles up-to-date. With the experience which has been gained with years of motor vehicle manufacturing, there should not be this lame method of development that was unavoidable in the early days of the industry. The cars developing from motorcycles will have inadequate brakes, wheels with insufficient hub width, and being cheap, will probably be fitted with steering gears which will not stand up. The spring suspensions will not be able to carry the loads which will be put into the van bodies, frames will be too light, and the tread so narrow that the vehicles in the hands of reckless boy drivers, will be overturned into the ditch when rounding corners at high speed. But out of this chaos of unsuitable design will emerge a few well designed, carefully built, 500-lb. delivery vans which will stand up.

Let the designer think this over seriously, and try if possible to plan such a vehicle now, and not subject the users to the usual humiliation of testing vehicles for the maker, and pointing out to him the mistakes in his own car.

The field for such vehicles is so large that it is well worth while for capital to investigate and supply this demand,—a demand which many do not yet realize exists.

MAY WILL BE A SALES AND SERVICE NUMBER



WE FEEL that there are two subjects of paramount importance to the dealer, the manufacturer and the user. These are sales and service. Sales methods, sales organizations, are always of interest to the manufacturer and dealer, while the question of service affects also the user.

Service is the one thing that is more misunderstood than any other. In the May issue of the COMMERCIAL CAR JOURNAL we shall have many articles by leading men in the trade and from well known users which will throw light on this vexed subject of service. There will be the opinions of the dealers on what they believe constitutes service, and what they can give and still make a profit.

The user's idea of service will also be given, and from this data it will be possible to arrive at some satisfactory conclusion as to what service really means. At the present time the word service covers a multitude of sins. There seem to be as many ideas of service as there are individual dealers and users.

There will also be descriptions of the prominent features of service stations; outlines of special service methods; articles by sales managers on salesmanship; how to build up sales organizations, and on the best plans for successfully marketing commercial cars.

This is an issue which should be invaluable to not only the trade, but to the user, and we invite all those who feel

that they have a message on these subjects, which will bring about a better understanding of what service means, or who feel that they can give information which will better existing conditions, to make use of our columns, and trust that the resulting interchange of ideas in these two most important topics, sales and service, will bring beneficial results to the industry.

Steel and Rubber Markets

Steel Prices Drop Slightly

Although steel prices are at present from \$4 to \$10 lower than a year ago, the lower prices have thus far failed to bring out any new business to speak of. The car business is the most active branch of the steel business.

Quotations on April 8th were:

STEEL PRODUCTS PRICES

| | | |
|--|---------|-------|
| Bessemer steel, per ton, mill | 21 00 a | 21 50 |
| Open hearth, per ton, mill | 21 00 a | 21 50 |
| Sheet bars, per ton | 22 00 a | 22 50 |
| Steel bars, soft base, half ex tidewater | 1 31 a | 1 36 |

The above prices are at tidewater in carloads and larger lots. For quantities less than 2000 lbs., but not under 1000 lbs., \$2 per ton additional is charged, and less than 1000 lbs., \$8 per ton additional.

SHEETS

The following prices are for 100-bundle lots and over f. o. b. mill; smaller lots \$2 per ton higher.

| Gauge— | Black. | Galvan-ized. | Gauge— | Black. | Galvan-ized. |
|--------------|--------|--------------|--------|--------|--------------|
| Nos. 22 & 24 | 1 80 | 2 10 | No. 28 | 2 00 | 3 00 |
| Nos. 25 & 26 | 1 85 | 2 80 | No. 29 | 2 05 | 3 05 |
| No. 27 | 1 90 | 2 90 | No. 30 | 2 10 | 3 25 |

IRON AND STEEL AT PITTSBURGH

| | | |
|--|---------|-------|
| Bessemer iron | 14 90 a | |
| Bessemer steel, f. o. b. Pittsburgh | 21 00 a | 21 50 |
| Muck bars | 28 00 a | 29 00 |
| Skelp, grooved steel | 1 20 a | 1 25 |
| Skelp, grooved iron (80 per cent.), seaboard | 1 55 a | 1 60 |
| Ferro-manganese | 38 00 a | 39 00 |
| Steel, melting scrap | 12 00 a | 13 00 |
| Steel bars | 1 10 a | 1 20 |
| Black sheets, 28-gauge | 1 95 a | 2 00 |
| Galvanized sheets, 28-gauge | 2 95 a | 3 00 |
| Blue annealed, 10-gauge | 1 40 a | 1 45 |
| Tank plates, 3/4-inch and heavier | 1 20 a | 1 25 |

Crude Rubber Inactive

Quiet conditions have prevailed during the past month both here and abroad in the rubber industry. Manufacturers of rubber goods everywhere seem disposed to operate in a conservative way in the matter of purchases of crude material. The world's visible supply of Brazilian rubber decreased 730 tons during the month of March. Quotations on April 8th were:

| | | | | | |
|------------------|---------|----|---------------------|---------|----|
| Up-River— | | | Ciudad, b/k | 48 a | .. |
| Fine | 74 a | .. | Trinidad, b/k | Nominal | |
| Coarse | 44 a | 45 | Africans— | | |
| Island— | | | Massal, red | 47 a | .. |
| Fine | 69 a | 70 | Red C'go | Nominal | |
| Coarse | 32 a | 33 | B'k C'go | 47 a | .. |
| Cameta | 35 a | 36 | Soudan— | | |
| Caucho— | | | Niggers | Nominal | |
| Balls | 45 a | 46 | Gambia, prime | 44 a | .. |
| Centrals— | | | East India— | | |
| Corinto | 42 a | .. | Smk, sh'ts | 64 a | 66 |
| Esmeralda | 42 a | .. | Ceylon bis & sheets | 63 a | 64 |
| Guatemala, slab | 38 a | .. | Pale crepe | 64 a | 65 |
| Mexican— | | | Pontianac— | | |
| Scrap | 42 a | 43 | Prime plantation | 6 a | .. |
| Strips and scrap | 40 a | 41 | Palembang | 6 a | 7 |
| Guayule | Nominal | | | | |
| Balata, sh't | 64 a | 66 | | | |

DOMESTIC SCRAP RUBBER

| | | |
|-----------------|---------|----|
| Boots and shoes | 6 3/4 a | 7 |
| Tires— | | |
| Automobile | 4 1/2 a | .. |
| Red | 7 a | 8 |
| Inner tubes | 10 a | 17 |

DEATH OF J. ELWOOD LEE, TIRE MANUFACTURER

J. Elwood Lee, founder of the Lee Tire & Rubber Company, Conshohocken, and Vice-President of the Johnson & Johnson Company, manufacturers of surgical supplies, died suddenly at his home on April

8th, at the age of 55 years. Mr. Lee started in business thirty years ago, manufacturing surgical instruments and supplies. He was successful from the start and became a millionaire in a few years. The business grew gradually year by year until now it employs more than 800 men, and the pres-

ent capital of the company is \$2,000,000. In 1905 it was the largest of its kind in the country, with the exception of the Johnson & Johnson Company, at New Brunswick, N. J., and the two companies were merged, although each kept its own identity. About the same time the Lee Company took up the manufacture of automobile tires.

How the Baltimore Bargain House Doubled the Efficiency of Its \$60,000 Commercial Car Installation

Trucks Show Saving on Short Hauls—Details of an Unique Removable Body Loading System



HE progressiveness of the Baltimore Bargain House of Baltimore, Md., is nowhere more clearly shown than in their efficient method of loading and unloading their large fleet of motor-driven vehicles by using removable bodies and overhead triplex block trolley hoists. The growth of this company since it started with one small building on Baltimore Street in 1895, has been phenomenal. At the present time they occupy a twelve-story building containing 240,000 sq. ft. of floor space on the same site as the first small building on Baltimore Street, and are now constructing the largest storage warehouse in the State. The method of handling the motor truck equipment is very typical of the up-to-dateness of this firm. The installation is, therefore, described in more or less detail, as it will doubtless prove a model upon which many similar installations will be built.

Superintendent George P. Neilson early recognized the fact that the trucks were not giving as economical service as they should, and was brought face to face to the problem of obtaining more loading space and cutting down the loading time. Two years ago at the New York automobile show, he was impressed by the attempts in various directions by removable bodies, etc., to solve the loading problem. He realized that it did not pay to allow such valuable units to stand for an hour to be loaded, when the total trip and unloading could probably be done in the same length of time. He therefore set about to devise a method which would cut down the loading time and economize the small amount of available loading space. The present loading system is the result, and has proved so successful that it will also be installed in the tremendous new warehouse building which is now being erected.

Removable-Body Triplex-Block Loading System

The system as worked out by Mr. Neilson consists in the use of special removable bodies in combination with overhead trolley triplex blocks made by the Yale & Towne Manufacturing Company, New York City. At the Baltimore Street store the available space for loading is a passageway 38 ft. wide, and long enough for six wagons at a time. It would have cost many thousands of dollars to have secured increased space for loading facilities in the immediate vicinity, and this was out of the question. With the removable body method the problem was solved so satisfactorily that eight trucks can now be loaded simultaneously if necessary, and it takes less than 5 minutes to dispose of an empty body and take on a five-ton load.

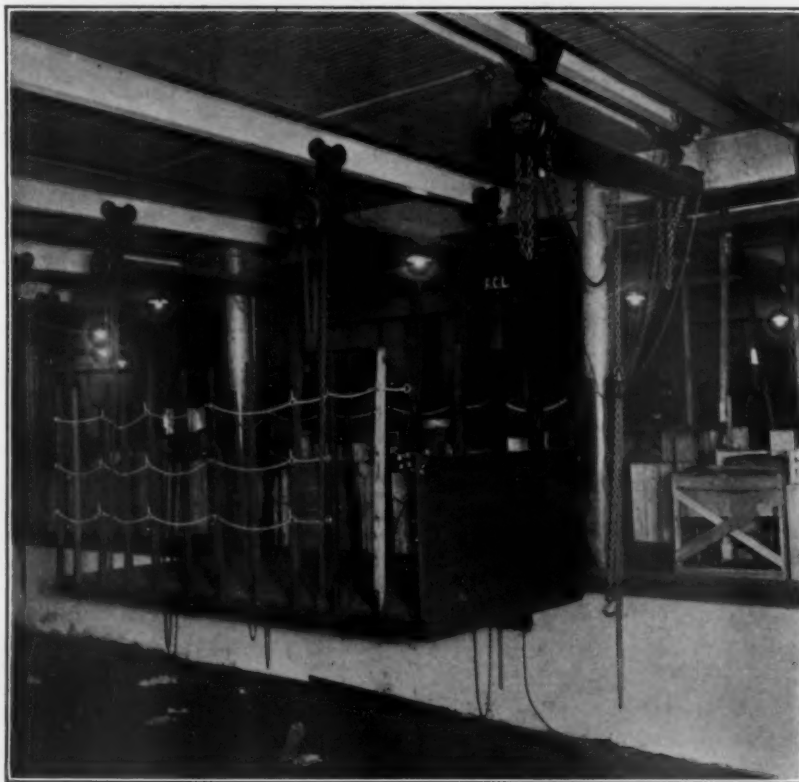
The Suspended Bodies

The empty bodies are hung, as shown in the accompanying illustration, from the overhead triplex blocks on trolley beams which extend across the 38-ft. areaway into which the trucks are driven. These bodies are exactly on a level with and against the edge of the loading platform. At the center of this platform is a box conveyor, which delivers boxes, bales, barrels, etc., directly on to hand trucks operated by the loading force. These are immediately wheeled onto the suspended truck bodies, which are all of the stake type, the stakes nearest the platform of course being removed, and the load properly packed. Movable fence-like projections divide the loading platform space in front of each of these bodies so that goods for that section of the country which the particular truck in question is to cover are placed in front of its body.

There is a line of eight of these bodies against the platform, with but 9 in. clear-

ance between their ends. There is always at least one empty space; into this the empty body of the truck which comes in, is run. The truck drives directly opposite the space which the body is to occupy against the platform. The driver jumps off, and one of the chain men slides the Triplex blocks on the overhead trolley over the empty body, four pendant chains terminating in hooks are hooked in bolts in the side of the body, and it is then raised about 4 in. above the level of the truck platform, which is sufficient to clear it from projecting metal retainers, which prevent the body from slipping. The instant the body is clear the driver and chain man propel it rapidly to the front of the platform, the driver jumps back into the truck, and pulls forward or backward in a straight line, stopping opposite whichever body is to be his load, jumps off, trolleys the load away from the platform its own width, which brings it over the truck, and then lowers it the 4 in. into place.

(Continued on Page 34)



Removable Body and Loading Platform

This view shows one of the removable bodies suspended from the triplex blocks in place against the front of the loading platform. This picture shows as general a view of the platform as could be obtained.



THE third annual commercial car show held by the Boston Commercial Vehicle Association closed on March 21st, in Mechanic's Building, Boston, Mass. This was practically the only commercial car show of any size this year, there being none in New York or Chicago since the Automobile Chamber of Commerce, Incorporated, decided that it did not pay to include the commercial cars at the national shows.

The Boston dealers felt, however, that they would like to hold a show this year, but it is questionable whether a show will be held in 1915.

This year's show was very well attended, somewhat better attended than last year. Many of the exhibitors did a good business, but it was noticeable that less floor space was occupied than formerly and that a few of the large makers occupied a very large percentage of the total floor area, so that, although there were many vehicles shown,

there were not as many makes represented as formerly. There were some eight exhibits this year that were not in last year's show, but this did not offset in numbers those not represented. In our last issue we published a complete list of the exhibitors. Prominent on the floor were the Packard, White, Autocar, G. M. C., Pierce-Arrow, Buick, Garford, Federal, Kelly, Stanley, Knox, Locomobile, Selden, Kissel, Chase, Standard, Velie, Reo, Lauth-Juergens, Republic, Atterbury and Walter. The exhibit of the White Company was unusually large and occupied several prominent places.

Sales Were Made

There were reported good sales during show week, the attendance aside from the first night being very noticeably composed of substantial business men who were thoroughly in earnest investigating and comparing the different vehicles.

The city representatives attended on municipal night in large numbers, and sales

of vehicles were made to the city for municipal service. It is certain that such a collection of trucks is an excellent opportunity for business men of the surrounding territory, and especially from smaller cities, where very few of the trucks are represented by agents, to study and decide what vehicle will best serve their needs.

Among the older exhibitors there seems to be a general feeling that the shows are not a very good paying proposition, as they are already well established. Among the newcomers who are placing agencies there is just the reverse sentiment, that the shows are a fine thing for them and should be continued.

Bodies were a feature of the show, there being many novel constructions, including fire apparatus, parcel post delivery, many dumping body coal trucks, lumber wagons and illuminated bodies for advertising purposes.

The Front-Wheel and Four-Wheel Drive Walter Trucks

By D. E. SCRIBER

THE Walter trucks, in front wheel drive, four-wheel drive and four-wheel drive and steer tractors, are the product of the Walter Motor Truck Company, 49-51 West 66th Street, New York City.

Back of those vehicles is Mr. W. Walter, one of the pioneers in the automobile industry, having been the original designer and maker of the well-known Walter pleasure cars, and for the past five years manufacturer of a line of conventional rear wheel drive trucks. He is now president of the Walter Motor Truck Company.

The Walter trucks are distinctively novel in construction in many respects, notably in power transmission methods. The Walter trucks are made in three distinct types: those that are front wheel driven only, those which have all four wheels driven and a short wheelbase tractor which has not only all four wheels driven, but in which all four wheels steer.

Advantages of Front-Wheel and Four-Wheel Drives

When a maker chooses to depart from what may be termed the standard type of

rear wheel driven truck, and places on the market a product which represents his financial interests, and which means his success or failure in the truck business, he usually gives the matter the most painstaking consideration before his decision is made. Mr. W. Walter could just as well have built any other type of truck, but chose the front wheel drive where but a single set of wheels are to be driven, and the four-wheel drive for the largest and heaviest units. His reasons for doing so were based on the advantages which he feels that this type of vehicle possesses. Stated briefly, they are as follows: Where but two wheels are driven it requires less power to move the loaded vehicle if the power is applied to the front wheels and the load is pulled instead of pushed. In a more or less crude way this principle may be demonstrated by attempting to push a loaded wheelbarrow through sand, and then by turning around and pulling it through. Where the load is on a wheel that is pushed it tends to bury itself, and requires more power for propulsion than when the load is on a wheel that is pulled.

Where the front wheels are live and being driven they tend to climb over obstacles and the action is different from pushing a

dead wheel against an obstacle. One of the greatest advantages, however, is the possibility of using inexpensive tires on the rear wheels, as these do not have to have traction. Some of these trucks are supplied by the Walter Company with 8-in. wide solid steel tires, the only objection to which is the noise they make on cobblestone pavements. The slightly increased vibration is negligible, as there is no mechanism at this end of the vehicle. These tires carry the heavy loads and last indefinitely. Other forms of tires which are less expensive than rubber can be used, such as felt or fibre which deaden the sound. They have been shown on these vehicles to have long life.

Economy of operation is claimed, as the actual power required to propel a given load by the front wheels is less than to push it by the rear wheels.

There is no mechanism whatever back of the driver's seat, either under or above the chassis, the length can therefore be made anything desired according to conditions, and any type of body can be used. It is even possible to make use of wagon bodies, or to attach existing bodies if desired. This truck can either be supplied as a complete unit, or merely as a drive to take the place of the front wheels of the horse truck. The

claim is made that from \$300 to \$500 per year can be saved on tires alone.

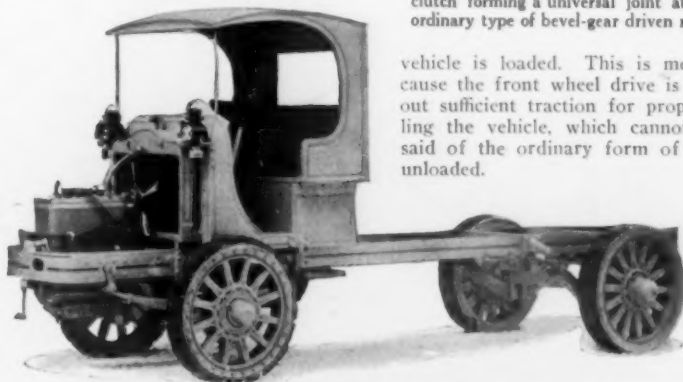
There being no mechanism whatever back of the seat, it is never necessary to remove the load in order to get at any of the vital parts. The claim is also made that the truck is non-skidding as far as this is caused by the differential action of driven rear wheels. Non-skidding is also assisted by having the brakes act on all four wheels, and steering is assisted by having the steering wheels alive. When propulsion is through the front wheels, it is possible to pull out of difficult positions with the front wheels cramped to any angle, it not being necessary to have the wheels point practically straight ahead before the vehicle can be started.

Four-Wheel Drive Advantages

If very heavy loads are to be carried and greater traction than can be obtained by two wheels is desired, all four wheels can be driven. With the Walter design this is a simple matter, as the power plant at the front is so arranged that a shaft can be run to the rear. This is the type of vehicle that is especially sought after by foreign governments for army work, and our own government specifies this form of drive for heavy army hauling. Driving and braking strains are equalized, and traction is never lacking. When one wheel strikes a slippery spot, and fails to drive, three-quarters of the tractive effort is still retained, and even two wheels might fail to be on sufficiently good surface to give traction, and yet two more would do the pulling. The only possible disadvantage to such a construction is the added complication and this has been cut to such a low point in the Walter construction that it is practically negligible, as will be shown by the detailed description which follows.

Four-Wheel Drive and Steer

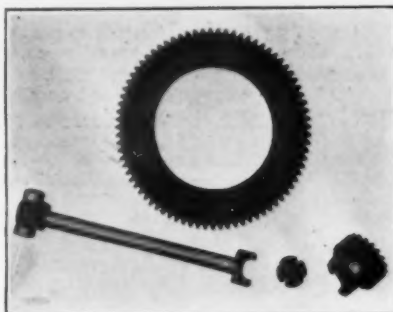
For trailers and train work the short wheelbase four-wheel drive and steer tractor is provided. This has all the features of the four-wheel drive, with the additional advantage of being able to turn in an extremely short radius. It also makes it possible for the trailers to track the forward vehicle. Brakes on all four wheels effectively care for the great momentum of the tractor and train. This company has been



View of Front-Wheel Driven Walter Truck

This shows the compact en bloc four-cylinder unit power plant, three-point suspended at the front, under a hood. Diagonal-block rubber tires are employed on the driving wheels at the front. The rear wheels can be fitted with steel or fabric tires, doing away with the expense of rubber.

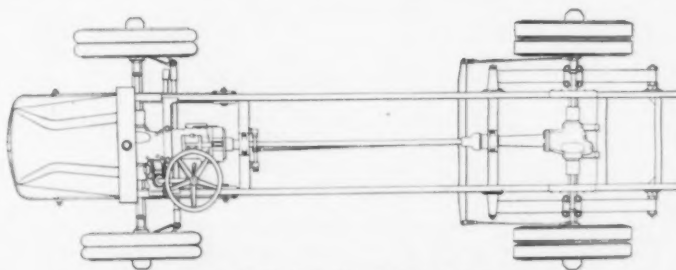
following very closely the latest and most advanced foreign practice along these lines, including the government tests of vehicles of this type. The French Government has made a special class for four-wheel driven trucks and tractors.



Driving Mechanism of Walter Front-Wheel Driven Truck

These are the elements through which the front wheels are driven; namely, a short shaft fitted with a universal joint at the inner end, and a special ball joint in the hub of the small driving pinion at the outer end. The large spur gear is bolted directly to the wheel, and all of the mechanism is enclosed, forming an efficient drive.

Reviewing the Walter line in general, it will be seen that all the units underlying the construction of all the vehicles are contained in the front wheel driven truck. The entire power plant and driving mechanism is concentrated at the forward end over the front axle, giving traction to these wheels when the vehicle is running light and added tractive efficiency when the



Plan View of Walter Four-Wheel Drive Truck

The mechanism at the front is identical with the trucks which are front-wheel driven. Through a clutch forming a universal joint at the rear of the transmission case, the power is transmitted to the ordinary type of bevel-gear driven rear axle by shaft. Brakes are applied to all four wheels.

vehicle is loaded. This is mentioned because the front wheel drive is never without sufficient traction for properly propelling the vehicle, which cannot always be said of the ordinary form of drive when unloaded.

the size of the parts. The engine details will be dealt with in another paragraph, these following more or less standard practice.

Method of Motor Mounting

The motor is fitted with a trunnion at the forward end of the crank case, which rests in a fixture on the frame and forms the front support of the power plant. The fly-wheel, as usual, is at the rear. The rear end of the case is expanded, forming a housing around the flywheel, and is bolted directly to a similar front end of the transmission case. This case has integral lugs or bosses on the sides amidships through which vertical suspending bolts pass having castellated nuts on the under side. These large suspension bolts are carried at the upper end by a cast steel cross frame

Accessibility

Although the mechanism is very compact and a long carrying space is provided back of the driver's seat, the engine is not in an inaccessible position under floor boards, but is under a hood which is well forward, protruding somewhat beyond the front axle, making the engine unusually accessible when this one-piece hood of Renault type is removed.

Unit Power Plant and Drive

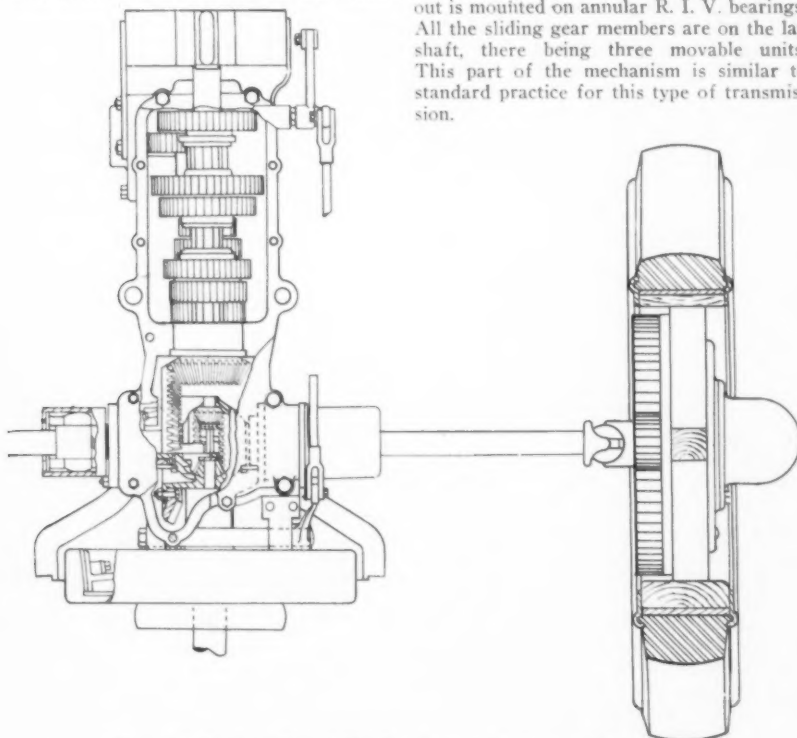
The entire mechanism at the front is self-contained in a single unit, three point supported with the shortest and simplest possible drive to the front wheels through two short Cardan shafts, each of which is fitted with a spur gear at the outer end meshing with a large spur gear encased on the wheel.

The construction is very compact and so arranged that this unit does not have to be altered or changed in any way on vehicles which drive the rear wheels also. In other words, the power plant and forward transmission mechanism on the front wheel drive is exactly identical with that used on the four-wheel driven vehicle. In the same way the steering gear with modified reduction is arranged so that by connecting a longitudinal shaft with a universal joint at its forward end, the rear end carrying a steering arm can be connected by the usual linkage to the rear wheels.

The engine itself is a four-cylinder unit en-bloc construction. On the five-ton vehicles it is $4\frac{3}{4}$ bore by 6-in. stroke, rated as 35-40 h.p. On the three and four-ton trucks the motor has a bore of 4 in. and a stroke of 5 in., rated at 30-35. These motors are practically identical in construction, the difference in them being simply in

member and form a two-point suspension for the power plant and change gears. The trunnion at the front forms a flexible point of suspension, giving this combined power plant unit a three-point suspension in the truck frame.

The cross frame member at the front,



Plan of Change-Speed Mechanism, and Front-Wheel Drive

This view shows the plan of the transmission gears, the universal-joint shaft running to the right and left to the front wheels, and one wheel in section, disclosing the ball joint and the driving pinions. This is all of the mechanism, there being nothing back of these transmission gears.

which virtually forms a buffer, is held at each end with bolts and can be taken out, permitting the removal of the entire unit power plant through the front, after disconnecting the driving shafts extending to the wheels, and removing the two suspension bolts at the center of the transmission case.

The spur gears driving front wheels are $1\frac{1}{2}$ in. face, 5 in. pitch, the large gear being an annular ring bolted to the inner hub plate. Both gears being entirely enclosed and packed in grease, are therefore well protected from the road.

The Change-Speed Mechanism

The makers, realizing that large gear reductions are essential to the truck, and that efficiency on low speeds is more essential in a commercial car than in any other, use the well-known foreign practice in the change speed gears of placing the lay shaft or countershaft, as it is sometimes called, directly above the main shaft of the transmission which is in line with the engine shaft. This gives no direct drive, but results in a more direct drive on the low speeds, and does away with a divided main shaft in the transmission case. On all speeds, even including the lowest, the drive is through a single set of spur gears in the transmission case. Four speeds ahead and one reverse are provided, making possible an exceptionally low gear for the lowest speed.

The forward end of the lay shaft carries a bevel gear which drives the bevel gear differential of the usual type. At each side of this bevel gear differential are universal slip joints with short shafts running outward to the ball joints and pinions, driving the front axles. The transmission throughout is mounted on annular R. I. V. bearings. All the sliding gear members are on the lay shaft, there being three movable units. This part of the mechanism is similar to standard practice for this type of transmission.

standard parts, when auxiliary power apparatus is desired.

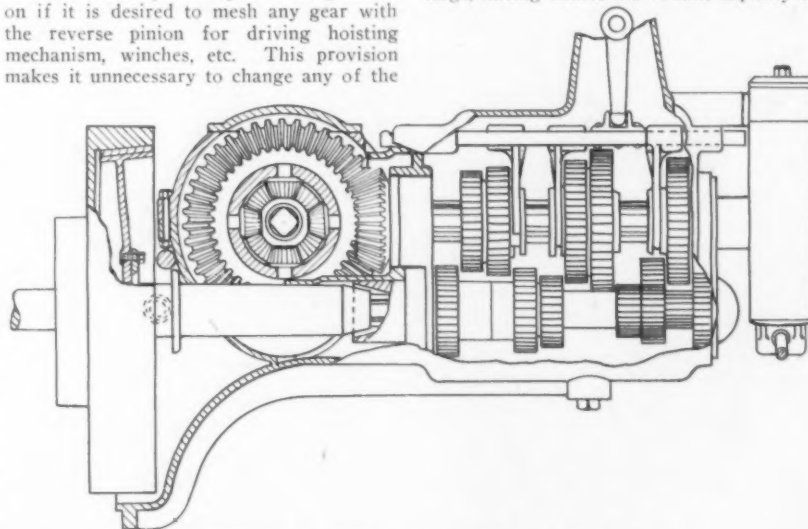
The connection between the engine transmission is by a standard cone clutch leather faced with easy engagement springs inserted under the leather. The forward end of the main shaft of the transmission is milled from the solid, forming four splines which enter the hub of the clutch cone, this combination of clutch and splined shaft therefore form a universal and slidable connection between the engine and transmission, relieving any strains which there might be a tendency to set up between the two units, and also providing an easy and simple method of disconnecting or separating the two when at overhauling periods it is desirable to take out the parts.

The Braking System

The rear end of the transmission lay shaft extends rearwardly from the case and carries a cast steel drum on the exterior of which is a contracting, asbestos-faced, band brake. This is connected directly with the usual control pedal, but is also interconnected with the rear wheel brakes. A hand lever is so attached that it will operate the rear wheel brakes alone. The pedal, however, operates both rear wheel brakes, and also the transmission brake, which of course, through the driving shafts, controls the front wheels, thus giving a braking effect on all four wheels. The rear wheel brakes are cast steel drums bolted to each of the spokes of the rear wheels. They are 18 in. in diameter with a 4-in. face. These drums are engaged by cast steel shoes cam expanded and faced with copper asbestos fabric. The pull rods connect to a full frame width equalizer and by a single center pull rod to the brake pedal. This makes a most efficient braking system, as the operator by lever can control the rear wheels only if desired, or with the pedal can give braking effect to all four wheels.

The Motor

The motor is a four-cylinder unit of L. head type. The exhaust valves being very large, having double the volume capacity of



Side Elevation of Walter Change-Speed Mechanism

The little shaft is a prolongation of the engine shaft. This drives through integral gears to the lay shaft above, on which are the sliding-gear members, there being three. This produces four speeds ahead and one reverse. The drive is then by the usual bevel-gear pinion, with differential gears at the center, and side shafts leading to the front wheels.

the intake valves. These are operated as usual by a single cam shaft with integral cams mounted in three Parsons white bronze bearings, and is removable through a hole at the front of the case. The bearings are very large, their diameter being great enough to cover the greatest radial extent of the cam. The crank shaft is drop forged chrome vanadium, the bearings of which are somewhat peculiar, the arrangement being, however, very logical. The front of the shaft is carried in an annular ball bearing which gives a short distance lengthwise for the bearing at this point. The center and rear bearings are plain Parsons white brass, the rear bearing having a

The upper ends of these rods are made adjustable by a vertical screw with a cup-shaped head carrying a fibre cover, the adjustment being retained by a lock nut. The usual screw plugs cap the openings of the valves. On the engine head is a casting which serves as an outlet water connection to the radiator and the rear end of which forms a support for the four-bladed propeller-type, cast aluminum fan. This fan, which is at the rear of the engine, is directly in front of the radiator which is in the dash, and forces air positively through the radiator by blowing and not by suction. The inlet and exhaust manifold, and also a housing covering the governor connection to the throttle in the intake pipe, are cast integral and bolted to the engine side. The governor is of the fly ball type in one of the half-time gears enclosed in a housing at the front. This governor can be set for any predetermined engine speed and oper-

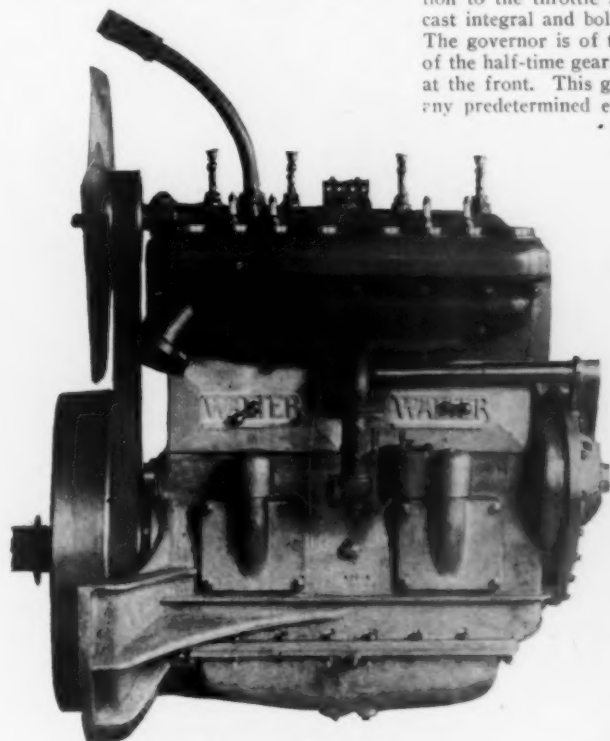
A 20-gal. gasoline tank located under the driver's seat provides fuel by gravity feed to the motor.

Cooling System

The cooling system is also very simple, consisting of a vertical fin tube radiator just forward of the dash, and the small centrifugal pump on the left of the engine, which draws the water from the bottom of the radiator, forces it into the lower portion of the engine jacket at the left side, the water passing out through the heads, through the casting before mentioned, which also supports the four-bladed aluminum fan which forces air through the radiator.

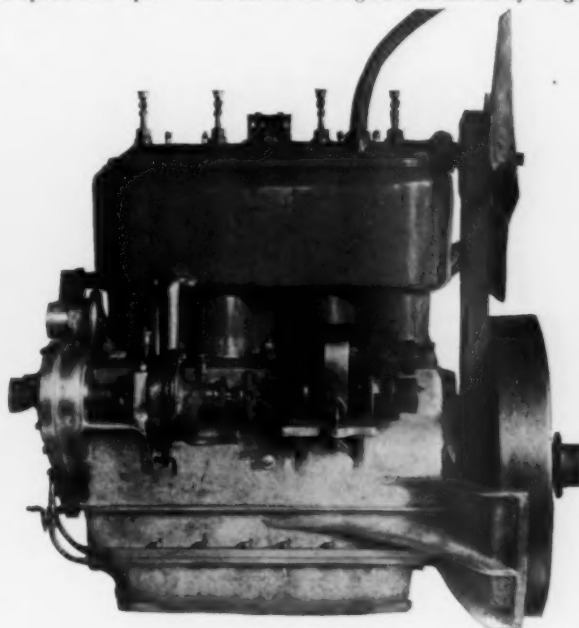
The Ignition System

An Eisemann automatic advance magneto with automatic spark control is mounted on the left of the engine and driven by longi-



Inlet and Exhaust Side—Walter Motor

The carburetor is placed directly on the manifold; the governor control encased, and running to a throttle on the intake pipe



Magneto Side—Walter Motor

This shows the en bloc cylinder casting, magneto and water-pump drive, and at the left, the front supporting member at the three-point mounting

length of $3\frac{1}{2}$ in. This gives a large plain bearing at the flywheel end and a ball bearing at the front, where the duty is not so heavy. The flywheel is bolted to an integral crank shaft flange.

The I section drop forged connecting rods are $12\frac{1}{2}$ in. center to center, the big ends having the caps held by four $\frac{3}{4}$ -in. bolts with castellated nuts and fitted with Parsons white bronze bearings. The wrist pin ends carry sleeve bushings which are force fits onto their rod and have their bearing on a hardened and ground hollow steel wrist pin which is shouldered at one end into one piston boss and taper pinned into the other piston boss, preventing turning or side slipping. The pistons are the usual cast iron construction with slightly domed heads and carry four diagonally cut eccentric rings at the upper end. The valves are Tungsten steel, and, as before mentioned, the exhaust valve is of very large diameter, giving an unusually free exhaust. The push rods are of the mushroom end type slightly off center so that they are continually turning, equalizing the wear.

ates a butterfly valve in the intake pipe after the mixture has left the carburetor.

Simple Lubricating System

The oiling system is about as simple as can be imagined. The pump draws oil from a sump at the bottom of the crank case, this portion of the case being removable, and forces it through a copper pipe with a suitable test cock into a cored passage in the lower portion of the crank case. Cored ducts lead into troughs, into which the big ends of the connecting rods dip. As these ends are fitted with scoops a sufficient oil spray is maintained to care for the entire engine. No individual leads are required. The overflow and splash accumulate in this reservoir at the base, same being fitted at the lowest point with draw-off plugs. At the proper level is a test cock which serves to show when the case has been filled to the proper level, the filling being done through either one of the breather pipes which are cast integral with the inspection plate covers.

tudinal shaft from the half-time gear train. The wiring is very simple, being direct from the magneto to a fibre holder at the center on top of the engine and to the plugs which are in the caps over the inlet valves. This system does away with the necessity for any spark control lever on the wheel, there being merely the usual throttle lever. The other control levers are of the ordinary type with the 20-in. steering wheel at the left, clutch and brake pedals on either side of it and the change speed and brake lever at the center. The rear of the dash comes close to the wheel. At this point is mounted a small lever which controls the Autovox horn. When the lever is moved it throws a small friction wheel into contact with the rear of the flywheel operating a small pump about the size of a cup which forces the air through this musical continuous toned horn.

Frame and Springs

As the frames of the various machines are very similar, except as to dimensions and sections, a description of that on the

five-ton machine will suffice. It is of rolled channel section steel 6 in. in depth, 2-in. flanges and 32 in. wide with heavy cast steel channel section cross frame members equal in depth to the side frame members. The rear corners are well braced with angle castings making an unusually staunch construction. The cross frame member at the front, as before mentioned, is removable, permitting the withdrawal of the power plant. This frame is mounted at the front on very long, flat, semi-elliptic springs, having a length of 56 in. and 3 in. width, of special vanadium steel mounted on top of the axle on spring pads shrunk on to the rectangular solid axle. The number and width of the leaves of course vary with the capacity of the vehicle. These springs are banded at both ends and shackled at the front. The spring bolts are bushed and fitted with grease cups. At the rear end the springs are carried in a steel casting which fits the underside and outside of the frame, being riveted rigidly to it, all in a most workmanlike manner. The rear springs are also of the same material, and on the five-ton truck have a length of 54 in. by a width of 4 in. They are underslung

at the rear axle, and with the truck body removed have a 1 1/2-in. camber. At the rear they are shackled to a cross bar 2 in. in diameter, which passes through cast steel fixtures which fit the outside and underside of the frame members and are rigidly riveted to them.

Axles and Wheels

Both the front and rear axles are of hammered carbon steel of rectangular section, the front being 2 1/2 x 3 in. and the rear 3 x 4 in. on the five-ton model. This steel might be described as a soft steel not inclined to brittleness and very suitable for this heavy duty.

The wheels are of heavy wood type on the five-ton model, fitted with 38 x 6 in. diagonal block front tires on the front wheel driven cars. On other models double continuous type tires are fitted on the front. The rear wheels in the front drive model can be fitted with steel tires as before mentioned, the five-ton truck having an 8-in. wide steel tire. All four wheels are mounted on large size roller bearings.

A wood cab completely protects the driver. The forward end is braced to the

dash, and with curtains in place makes a complete housing. The single seat with deep upholstered cushions has a width of 52 in., inside measurement. The equipment consists of horn, two side oil lamps, tail lamp, and tools.

This front wheel drive model is made in three, four, five and six-ton capacities. Prices, \$3200, \$3500 and \$3750 and \$4000, respectively, f. o. b., New York.

The other models, that is, the four-wheel drive and the four-wheel drive and steer tractor, have essentially the same construction. The four-wheel drive truck is made in five, six and seven and a half-ton units at \$4250, \$4500 and \$4750 each.

The Four-Wheel Drive and Steer Tractor

This vehicle is designed to carry a trailer mounted on a fifth wheel on the tractor, or for hauling a train. The wheels are fitted with 40 x 4-in. double tires both front and rear. The tractors have a capacity up to 12 tons, and sell for \$4500.

These vehicles make a complete line in themselves from 3 to 12 tons' capacity and meet all conditions of hauling within these limits.

The Parcel Post Equipment Car



NEW, small, specially built car for parcel post service has just been placed on the market by the Parcel Post Equipment Company, 875 North Street, N. W., Grand Rapids, Mich. Although designed in conformity with the Government specifications for cars handling parcel post delivery, these machines are eminently suited to all kinds of light delivery, having a capacity of 600 lbs.

Novel Features

This little car is laid out on different lines from anything heretofore placed on the market. At first glance the novelty consists in the extremely long hood at the front, which, however, is not a hood, but the parcel post carrying space. This compartment is made of sheet metal and has a capacity, as before mentioned, of 600 lbs. At the rear of it, just in front of the dash, is the actual engine compartment. The car is powered either by a two-cylinder V-type air-cooled motor 3 1/2 in. bore by 3 9-16 in. stroke, or by a four-cylinder, water-cooled en bloc motor, 2 3/4 in. bore by 4 in. stroke. A choice of these two engines is optional at the same price. This gives the purchaser a chance to have the type of engine which he particularly fancies. The power of these motors is very nearly the same. Back of the dash, which is located about two-thirds the distance from the front of the car to the rear, is a regular runabout body with a comfortable full width seat for two, with the wheel at the left and control levers at the center. A top, as well as a windshield, is fitted and the car carries electric side lights and tail lights. The gasoline tank is above the engine on the part of the dash in the engine compartment.

Another novel construction is the arrangement of the power plant. The three-speed sliding gear and the rear axle form

a triangular assembly, joined to the frame by a cross full elliptic spring, mounted at the center of the axle on the differential housing. The entire power plant assembly can be completely removed from the vehicle and replaced in 30 minutes, as will be explained in detail further on.

The frame is also novel in construction, being tubular and underslung. It is mounted on semi-elliptic springs at the front end, on the full cross elliptic spring at the rear. The features of this construction and the triangular power plant and rear axle assembly are shown in the accompanying plan view and other illustrations.

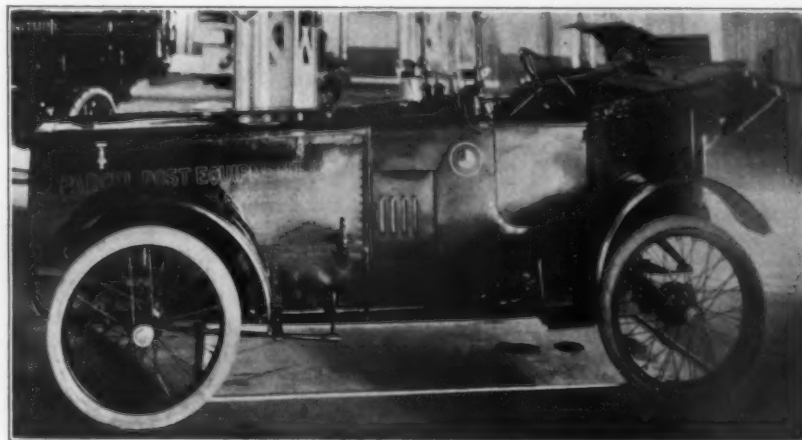
Details of Construction

From the foregoing it will be seen that the car has an entirely unique layout as

compared with other vehicles. It weighs complete 950 lbs., has a wheelbase 90 in., wheels 30 x 3 in., these being heavy type wire wheels, tires 30 x 3 in., option being given on a regular clincher or a regular Goodyear rim. The tread is 52 in. The loading space has the following dimensions: 56 in. long, 27 in. wide, 18 in. deep. A maximum width of 32 in. and a maximum depth of 20 in. may be had if desired.

Arrangement of the Units

Taking the different units in their order, from the front to the rear, we have the motor, a multiple disc metal to metal clutch housed and running in oil. This housing is bolted between the pressed steel shell which supports the engine and the transmission case. The sliding gear gives three speeds forward and one reverse, with the lay



Parcel Post Car Photographed at the Boston Truck Show

This new machine sells for \$790, with an option of a two-cylinder air-cooled, or four-cylinder water-cooled motor. It has an underslung tubular frame, and a capacity of six hundred pounds, the luggage space being at the front.

shaft on top. The final drive is by a Diamond roller chain running over a sprocket on the center of the axle and operating in oil, the whole being enclosed. The usual differential is employed at the center of the rear axle with divided live axle shafts. The wheels are keyed to the live axles and the axles run on Hyatt roller bearings in the ends of the housings. The rear bearings are also Hyatts.

There is nothing out of the ordinary about the sliding gear, which is of the usual three-speed type, connected through a mul-

it and running free on the engine shaft. This rotates the engine by a clutch on the front of its hub, which meshes with a clutch collar keyed to the engine shaft. The fact that the teeth of these two gears are helical causes this small pinion to be forced forward into engagement with the clutch on the engine shaft whenever the starting lever is pulled to rotate it, thus throwing the engine over. As soon as the engine starts the clutches release each other and as the small pinion is free on the engine shaft, this shaft simply turns within

no lever for it is required, the Atwater-Kent Unisparker system being used.

The front and rear wheels are protected by the usual guards webbed to the frame. The steering is by a bevel pinion and sector with the cross connecting link in front of the axle, the usual steering arm and drag link being used. The steering knuckle arms have specially attached balls connecting with the steering linkage, so that these can be readily replaced if worn without renewing the entire steering knuckle and arm. The front axle is of square section nickel steel, $1\frac{1}{4}$ in., with $1\frac{1}{4}$ in. spindles mounted on ball bearings. The semi-elliptic front springs, which are $1\frac{1}{2}$ in. wide, 40 in. long, 5 leaves, are mounted on top of the front axle and connect at the front to a cross bar passing through the spring horns, which in this case curve downward from this cross bar, the tubular frame itself being under the axle.

Removable Rear Unit

The entire triangular rear construction, which includes the rear axle, wheels and the entire power plant straight through to the rear axle, is connected at the forward end to cross frame members by a ball joint at the center, and at the rear end the connection is to the lower part of a full elliptic cross spring at the center of the differential housing, the pin connecting the two at this point being removable. This gives a two-point connection of this assembly to the body. The upper side of this cross spring is also connected in a similar way to the center of the rear cross frame member. This gives the entire body a three-point suspension, at the center, at the rear and at each side at the front on the front springs. By removing the pin either at the top or bottom of this rear spring and disconnecting the ball joint at the front of the power plant assembly the whole construction can be drawn out from under the car, making it a simple matter to get at all the parts. There are patents pending on this construction.

The car complete sells f. o. b., Grand Rapids, Mich., for \$790, with the following equipment: Top, windshield, Warner speedometer which, by the way, is connected to the left rear wheel; two side electric lamps, one tail lamp, tools, jack, horn and power pump.



Parcel Post Kar Power Plant Removed

By disconnecting a ball joint at the center and removing a single pin at the center of the rear spring the entire power plant can be removed as shown

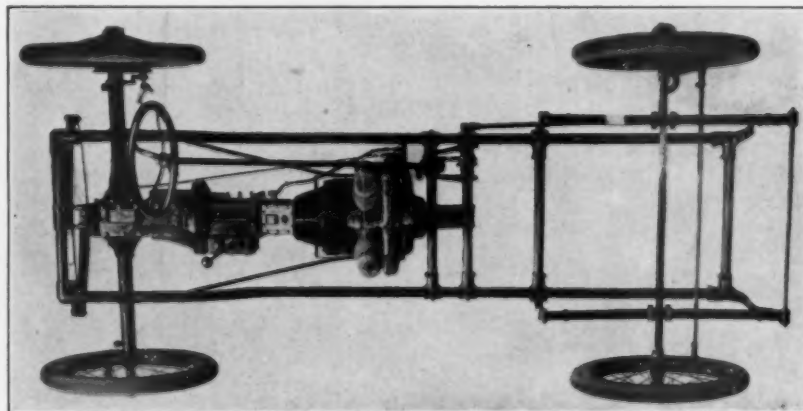
tipple disc clutch, but the controls are special.

Novel Control Features

As before stated, the wheel is at the left, the levers at the center. One of these, a ball-topped lever, controls the change speed gears and is of selective type. The other central lever serves a double purpose, this being a distinctive feature of the Parcel Post Kar. In normal position it is a brake lever, controlling an external contracting metal band brake with cork inserts, this being inside of the rear axle housing, protected from dirt. This lever controls the brake when pulled towards the seat. Its other function is that of starting the motor, giving a mechanical start from the seat. At the top of the lever is a release button, the brake sector having ratchet teeth, thus holding the brake when set. A certain part of the arc of motion of this brake lever operates the brake, but if it is pushed to its extreme forward position, it can then be used for starting the engine, by pulling it toward the seat. The lever operates on a short cross shaft with an arm at one end, and a rod running forward to an arm on a similar cross shaft just back of the engine. This latter cross shaft carries two arms, the ends of which have pendant from them, by ball and socket joints, arms which engage alternately ratchet teeth in the front of a 6-in. gear with helical teeth. When the starting lever is moved forward one of these little arms engages these ratchet teeth and when the lever is pulled back the gear is rotated. This rotation is communicated to the engine by means of a small helical gear in mesh with the large one and below

it. This mechanism is encased and operates in lubricant. Thus, the car is made self-starting from the seat without any additional control lever or pedals.

There is a small accelerator pedal of the usual type in the slanting part of the floor boards; also, a combined clutch and brake pedal, which is of somewhat novel design. It consists of an arm with a heel rest attached so that the foot of the operator can be placed on it, and rest comfortably in the pocket for the heel. The first motion disconnects the multiple disc clutch. A further movement applies a transmission brake. Below the steering wheel is a throttle lever. There being a fixed spark,



Plan of Parcel Post Kar Chassis

Showing the tubular underlugs frame and the unit construction of all the mechanical parts, same being mounted at one point on a ball joint and at the center to a cross elliptic spring at the rear

Chase Water-Cooled Models Exhibited at the Boston Show

BESIDES its well-known models, which have air-cooled three-cylinder, two-cycle motors, planetary in the small and sliding gear transmission in the large model, and chain final drive, and are furnished in 1500 and 2500-lb. capacities, the Chase Motor Truck Company, Syracuse, N. Y., will offer two models having water-cooled Continental motors, these machines having capacities of 2 and 3 tons respectively.

The Two-Ton Model R

As stated above, the motor is a water-cooled Continental, being four-cylinder and en bloc type. It is 4½-in. bore and 5¼-in. stroke, developing 35 h.p., its speed being controlled by an automatic fly ball governor, which cannot be tampered with without the owner's knowledge. The carburetor is a Schebler, and the magneto a Bosch. A centrifugal pump forces water through the cooling system and the gilled tube type radiator, which has the core mounted inside a pressed metal plate, so that it is free, irrespective of its housing. The whole is mounted on flexible supports.

Clutch, Transmission and Drive

Clutch is dry plate type, having saw steel contracting with asbestos wire faced discs. It is simple, durable and gives easy engagement.

The transmission is sliding gear selective type and Brown-Lipe manufacture. It gives three speeds forward and one reverse, and is housed in a single casing with the clutch and jack shaft, the complete unit having a three-point suspension, eliminating transmission strains.

The jack shaft is mounted on two flexible joints, which are bolted to the frame, and allow universal action, preventing strains being communicated to the tube or joints. Extremely strong radius rods are provided, and so mounted as to allow universal action between the frame and axle.

Frame, Springs and Axles

The frame is extremely wide and deep channel section pressed steel. Cross members are so arranged as to allow ample flexibility of frame, yet are sufficiently rigid to prevent distortion. Springs are semi-elliptic, especially long to give easy riding, the front being shackled at one end, and the rear at both.

gal. Loading platform height is 30 in., minimum. Equipment consists of side and tail lamps, full set of tools and horn.

The Three-Ton Model

This model, designated as Model O, is also powered by a Continental motor, four-cylinder, water-cooled, 4½-in. bore and 5¼-in. stroke. Magneto is a Bosch, with set spark, and the carburetor is automatic type.



Chase Two-Ton Truck With Water-Cooled Motor

Four-cylinder en bloc Continental motor; Brown-Lipe three speed forward transmission, and chain final drive. Chassis price, \$2100

Axles are one-piece forgings; 1¾ x 2¾-in. nickel steel rear, and 1¾ x 2¾-in. I beam front. The spindles carry large taper roller bearings, and steering is made easy by two large ball thrust bearings in the steering knuckle. Both brakes operate on the rear wheel hubs, service being external, and the emergency internal, both being foot-controlled.

Other Details

Tires are 36 x 4-in. front, and 36 x 3-in. dual rear. Steering gear is worm and wheel type, and control by accelerator and throttle. Wheelbase is 160 in., and tread 58 in. Fuel tank is 15-gal. capacity, and oil tank 2¼-

Clutch and Transmission

These members are built in a unit and bolted to the motor crank case. They are Brown-Lipe products, the transmission giving four speeds forward and one reverse. Gears are 3½ per cent. nickel, 1-in. face and 6-8 pitch. Shafts are carried on taper roller bearings.

Drive

Drive from the unit power plant is by a tubular drive shaft with universal joints at each end. The rear axle is David Brown worm type, mounted on imported annular ball bearings. The housing is a one-piece crucible steel casting, with the worm and wheel mounted on a separate carrier, bolted to the housing. Drive and torque are taken by the underslung springs. A large factor of safety is given throughout the entire construction.

The front axle is drop forged Elliot type, with extra large chrome nickel steel spindles, hardened and ground.

Frame, Brakes and Springs

Extra wide cold pressed steel is used in the frame, being 6¼-in. channel, with 6-in. offset in front to permit very short turning radius.

Both brakes are on the rear wheels, service being external contracting, and emergency internal expanding. The braking surface is extra large.

Springs are especially long and flat, eyes being bushed with hard bronze.

Wheelbase is 148 in.; chassis overall, 218½ in.; tread, 62 in. Tires are 36 x 4-in. front and 36-in. dual rear. Gasoline tank is 20-gal. capacity, and oil tank 2-gal.



Three-Ton Chase Truck With Water-Cooled Motor

Four-cylinder Continental 4½ x 5¼ in. motor; Brown-Lipe three speed forward selective transmission; worm final drive. Price, \$3000



Standard Worm-Drive Trucks in One Ton, and One and a Half Ton Capacities



STANDARD MOTOR TRUCK COMPANY, of Ohio, with factory and general office at Warren, Ohio, and general sales office at 1824 Euclid Avenue, Cleveland, Ohio, has augmented its line by the addition of two models, one and one and a half ton capacities, the both being constructed along practically the same lines, so that it seems sufficient to give a general description of the larger model, noting where the other differs from it essentially.

Motor

This machine, designated as B. X. is powered by an Ergon, unit power plant, four-cylinder, four-cycle, L-head type, water-cooled, under hood, 4-in. bore, 4½-in. stroke, fly ball governor set at 1200 r.p.m., giving 30 h.p. Water circulation is by pump, with three bearing crank shaft, and all valves enclosed. Oiler is self-contained, constant level, splash and gear pump. Full aluminum crank case with three point suspension. Crank shaft bearings are split and easily adjusted. Carburetor is Dayton Air Friction, with dash adjustment and hot-air pipe.

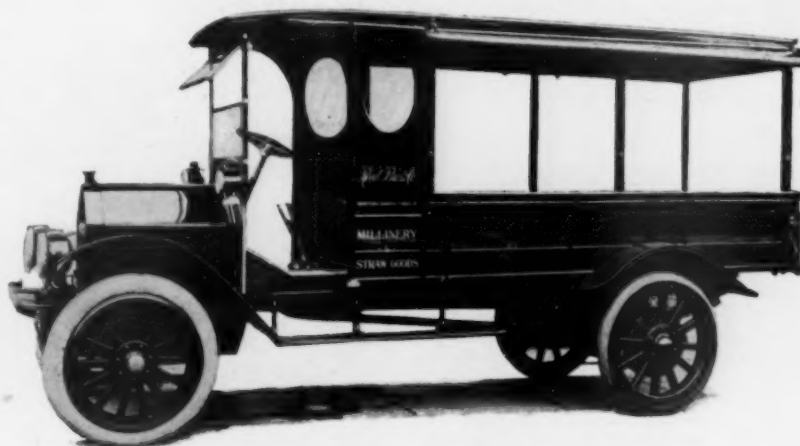
Ignition is by Bosch DU 4 magneto, and the radiator is Kurtzner genuine honey-comb with 3-in. section.

Clutch, Transmission and Drive

Clutch is multiple disc, running in oil in unit housing with motor specially arranged for accessibility. Thrust is taken by ball bearings. Eighteen plates insure smooth starting. Transmission is Brown-Lipe, also

in unit with motor. It is selective sliding gear, three speeds forward and reverse, with gears 1-in. face, shaft and gears

and model F in the smaller. It is full floating type, with Browne-Lipe gears and differential run in 1¾-in. chrome nickel shaft,



Standard One and a Half Ton Model With Worm Drive

Essentially the same as the one-ton model, differing principally in having the different parts sufficiently heavy for the purpose

chrome nickel steel specially heat treated. Bearings are F. & S. imported self aligning ball throughout transmission and clutch, Rhineland double ball throughout rear axle and differential, roller bearings in front axle. Drive is by shaft with worm and gear.

Rear axle is the product of the Chautauqua Motor Company, model E in the larger

and imported ball bearings throughout. It is equipped with Cleveland worm and gear, 13-16-in. pitch, with the worm mounted on top with positive self-contained lubricating device. All bearings are perfectly aligned and easy adjusted. The front axle is heavy I-beam type, vanadium steel in the small, and Krupp's chrome nickel steel in the large model. Roller bearings are used.

Frame, Springs and Wheels

Frame is Hydraulic Pressed Steel 3-16-in. stock, rail 49-16 in. high, specially widened to take load strain. Extreme width 38 in., front width 34 in.

An option of two wheelbases is given, 124 and 134 in. in the small model, and 134 and 144 in. in the large model.

On both models, and on 134-in. wheel base, length back of seat to rear end of frame is 8 ft. 4 in., back of seat to center of rear axle 5 ft. 9 in. The large model, with 144 in. wheelbase, length back of seat to end of frame is 9 ft. 4 in.; back of seat to center of rear axle, 6 ft. 7 in. Height to top of frame 35 in. unloaded. The smaller model, with 124-in. wheelbase, length back of seat to rear end of frame is 8 ft. 4 in.; back of seat to center of rear axle, 4 ft. 11 in. Height to top of frame 34 in.



Standard One-Ton Truck With Worm Drive

Four-cylinder 4 x 4½ in. motor; multiple-disc clutch; three speed forward transmission; shaft drive and worm rear axle. Price, \$1900

Springs are Perfection manufacture, rear $2\frac{1}{2} \times 52$ in.; eleven leaves on small model and fourteen on large. One end rides free on hardened steel roller under frame. Front $2 \times 40\frac{1}{2}$ in., one end free riding on hardened steel roller under frame. Spring eyes are bushed to size, and fitted to heat treated oiler bolts.

Wheels are Bimel, 36-in. front and rear, with $1\frac{3}{4}$ -in. square spokes of second growth

hickory, with extra heavy felloe and large flange. Both sets of brakes operated on rear wheel drums; $18 \times 2\frac{1}{2}$ in. on the large, and $16 \times 2\frac{1}{2}$ in. on the small model.

Solid demountable tires are regularly supplied; $36 \times 3\frac{1}{2}$ in. in front and 36×4 in. rear on the large model, and 36×3 in. and 36×4 in. on the small. Pneumatic demountable, quick detachable tires may be obtained at additional cost.

Control, Equipment, Etc.

Control is by right side steer and center gear shift, gasoline throttle lever on steering column and foot accelerator. A 17-gal. gasoline tank is carried under the seat.

Equipment consists of seat, gasoline tank, front fenders and running boards, three oil lamps, complete set of tools, tool box, horn and jack. The large model sells at \$2100, and the small one at \$1900.

The Kalamazoo Motor Truck



NEW truck is being brought out by the Kalamazoo Motor Vehicle Company, Kalamazoo, Mich. It will be about one-ton capacity, have chain final drive, and 110-in. wheelbase.

Motor

The power plant is a four cylinder Rutenber, $3\frac{3}{4} \times 5\frac{1}{4}$ in., and cast en bloc, developing 30 h.p. Cylinders are made of semi-steel gray iron, and carefully ground to size, leaving a gloss finish. Crank case is aluminum, scraped and finished in the natural color. It is made in two halves, the upper half for holding the crank shaft, bearings and caps, and cam shaft, all in position; the lower half contains the oil reservoir and is easily removed for adjustment of crank and connecting rod bearings. Valves are exceptionally large in diameter, and heads are $3\frac{1}{2}$ per cent. nickel steel, electrically welded to carbon steel stems. They are provided with long guides, which may be removed from the cylinder and replaced whenever necessary. The three-bearing type crank shaft is drop-forged from 40 point carbon open hearth steel, properly treated, carefully balanced on parallels. Both crank shaft and connecting rod are of a special alloy. Hoyt's nickel babbit, die cast, and provided with large oil grooves and heavy flanges.

Bosch high tension magneto, without batteries, furnishes ignition. The oil pump is of the plunger type, operated by connecting rod and plunger from eccentric on cam shaft. Oil is taken by pump from the lowest point of the crank case, through a close-woven wire screen and distributed through tubes to each of the connecting rod oil pans. The pans are arranged so that they will keep a constant level, providing sufficient oil to lubricate all the bearings and eliminate flooding and smoking. Radiators are set on coil springs, providing flexible mounting under all conditions.

Clutch, Transmission and Drive

The clutch is a self-contained, cone type 16-in. diameter, leather faced, with flat springs under the leather enable the clutch to engage without jerking. It is very accessible, and can be removed without taking out any other part.

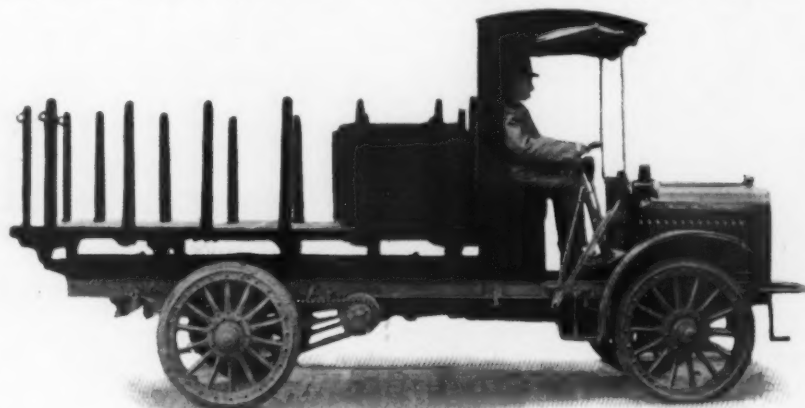
A 40-h.p. Covert, selective, sliding gear transmission is employed. Gears are of nickel steel, carbonized, heat treated, and accurately ground to fit shafts and receive bearings. The shafts are nickel steel, heat treated, and ground. Hyatt High Duty

Type Roller Bearings are used throughout. The case is a neat, compact design, made of light malleable iron castings of exceptional toughness and strength.

Drive is by shaft, with Spicer universals, to the jack shaft, and by side chain from the jack shaft to the rear wheels. In changing drive sprockets, it is only necessary to remove six bolts, the hub on the

The service brakes, operated by a foot pedal, are located at the outer ends of jack shaft. The emergency brakes, operated by a hand lever, are located on the rear hubs. These brakes are internal.

Springs are of the semi-elliptic type, made of special steel to stand the vibration. Front spring is 40 in. long, and rear spring 48 in. long, both are $2\frac{1}{4}$ in. wide.



The Kalamazoo Motor Truck

Four-cylinder Rutenber motor; Covert sliding-gear transmission, and chain final drive

taper end remaining on the shaft. By this method the sprockets, when worn, can be replaced at very little expense. The chains are Diamond manufacture, $1\frac{1}{4}$ in. pitch, $\frac{3}{4}$ in. wide, $\frac{3}{4}$ in. roller, straw tempered hard rollers; hard steel bushings; hard nickel-steel rivets, and reamed holes.

Axles, Springs and Frame

The front axle is a one-piece drop forging of very heavy I-beam section. The rear axle is rectangular in section, $1\frac{3}{4} \times 2\frac{3}{4}$, forged from a single piece of special steel. The spindles carry Standard roller bearings, with solid rollers, and races and cones made of special steel, with temper drawn, so that they are very tough and will not chip or break under severe service. The rollers offer a line of contact throughout their length, giving bearings great radial load and end thrust capacity.

The wheels are 36 in. in diameter, have fourteen 2-in. spokes, and are made of second growth hickory. The hub flanges are $10\frac{1}{4}$ in. in diameter. The brake drums, to which the rear sprockets are riveted, are fastened to the wheels by a belt through each spoke.

Frame is made of special cold-pressed steel, $\frac{3}{16}$ in. thick; the side members are $4\frac{1}{2}$ in. high, $2\frac{3}{16}$ in. wide. Five cross members are thoroughly riveted and heavily gusseted. The frame is $173\frac{1}{2}$ in. long, and extends the entire length of body.

Other Details

Steering gears, heavy type, worm and sector gear, adjustable large hand wheel is placed on right side. Standard tire equipment 36×3 in. front and 36×4 in. rear, solid flange type.

The weight of the truck without load is about equally distributed on the front and rear wheels. The rear wheels carry about 80 per cent. of the paying load, which not only gives ample traction, but allows the use of light and flexible springs in front, under the motor. This eliminates undue vibration, and results in long life of the machinery. The center of gravity is very low—a very desirable point.

Wheelbase is 110 in.; length over all, 192 in.; weight of chassis, 2800 lbs.; height from ground, $29\frac{1}{2}$ in. The gasoline capacity is 15 gal., with 3 gal. of it as a reserve supply.

The Kosmath Truck

A One Thousand Pound Delivery Built for the Purpose



LIGHT delivery car which has been thoroughly tried out in the hands of users for the past year, is being marketed by the Kosmath Company, with offices at 708 Ford Building, Detroit, Mich. This delivery job has been built strictly for the work for which it is intended, and is rated at 1000-lb. capacity. Not having grown out of a touring car design, the Kosmath Truck has many advantages in balance of the units and sturdiness of construction.

Motor Under Hood

The general arrangement of the mechanical details is clearly brought out by the chassis illustration. The motor is placed under the hood, and as a unit with it is the three-speed sliding gear transmission. The bore and stroke of the motor are $3\frac{1}{2} \times 4$ in., which gives a bore-stroke ratio of 1.22 and an S. A. E. rating for the motor of 19.6 h. p. The cylinders, of L-head design, are cast in blocks of two each, thus allowing for a center bearing,—a very desirable feature in truck motors. The water jackets completely surround each cylinder. On the valve side is the Kingston carburetor, while on the other side is the Swiss magneto, and the centrifugal pump. As is usual with motors of this type, lubrication is taken care of by the splash system.

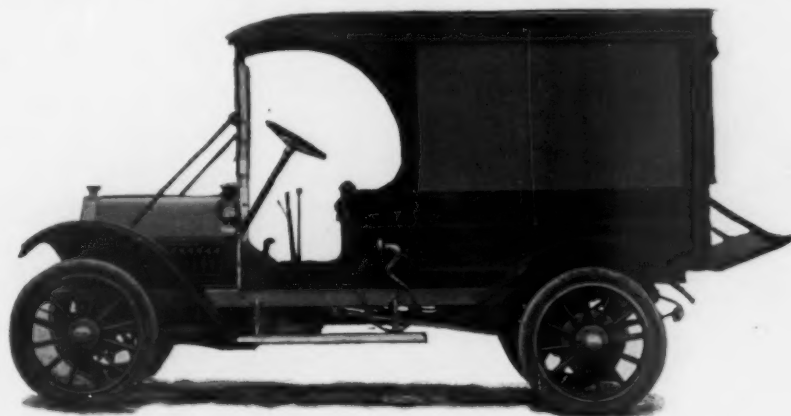
One of the difficulties which has been found in the light delivery field, has been overcome by the use of an ample sized radiator, the core in which is 3 in. in depth. The water passages are of the vertical tube type, but the front of the radiator has the appearance of the square tube construction. This radiator and piping hold approximately $3\frac{1}{2}$ gals. of water. The cooling is also assisted by a three-blade fan of propeller construction.

Accessible Gear Box

The sliding speed transmission is a unit with the motor, fastened to the same by a

bell housing. This places it in an equally accessible position as the cover comes directly under the floor boards. Both the gears and shafts in this transmission are made of $3\frac{1}{2}$ per cent. nickel steel. The enclosed cone clutch has a maximum diameter of $13\frac{1}{8}$ in.

been one which has been sadly neglected in many light jobs of the past. The shortcomings in this direction have been felt because of the exceptionally heavy service the brakes get in this kind of work, as stops are made in this line as many as 300 in a day. On this car sufficient braking surface



Side View of Kosmath One Thousand Pound Delivery Wagon
Four cylinder $3\frac{1}{2} \times 4$ in. motor; cone clutch; three speeds forward; three-quarter floating Weston-Mott rear axle. Price, \$900, express or panel body

Four-to-One Reduction

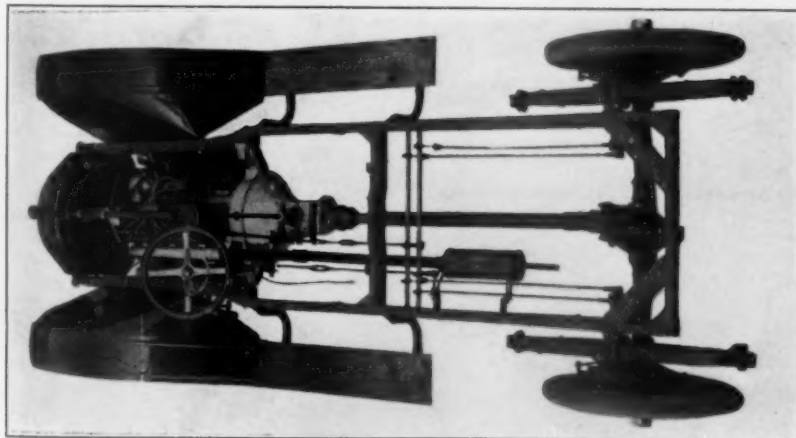
The drive is taken from the universal joint and slip joint at the rear of the gear box, through an enclosed shaft to a three-quarter floating Weston-Mott axle. The bevel gear reduction of the axle of 4 to 1 gives, with 32-in. wheels and a motor of 1000 r.p.m., a car speed of approximately 23 m.p.h. The motor, however, is not limited to this speed, as no governor is fitted, except as extra equipment when required. Although the mass to be retarded in a light delivery job is nowhere near as great as in a heavy truck, the problem of supplying sufficient braking service, has

is provided by drums of 14-in. diameter with 2-in. face. The service brake bands are external contracting, and the hand-brake is of the internal expanding type.

Other parts which get undue punishment in small capacity trucks, due to the excessive overloading which some owners insist upon indulging in, are the wheels, frame and axles. In the case of the Kosmath construction, these have been taken care of under the following specifications: The frame is of course of channel section, and $4\frac{1}{2}$ in. deep. The wheels are of twelve spokes, each of $1\frac{3}{8}$ in. diameter. The front axle is a drop forging, of the I-beam shape, with $3\frac{3}{8}$ in. depth and $1\frac{1}{2}$ -in. flanges. In the rear axle Hyatt heavy duty bearings take care of the loads. The drive from the rear axle to frame is through two long radius rods, which are hinged at the forward end. This allows for full elliptic springs, shackled at both ends with a master leaf 36 in. long by 2 in. wide. The front springs are semi-elliptic, 38 x 2 in.

Left-Side Steer

Following the constantly increasing school of left-side drive, the steering wheel is placed on that side, and the control and brake levers are in the center. However, easy access is given from the right-side step, and this not only makes for easy delivery when the driver is alone, but in case a package boy is carried. He is on the curb side, where very quick action can be expected. Because of the not too great skill of the usual delivery driver, the control mechanisms have been reduced to their simplest terms. The carburetor is controlled entirely by a foot throttle, while



Plan View of Kosmath
Clean cut, well designed, and substantially constructed

Springs are Perfection manufacture, rear $2\frac{1}{2} \times 52$ in.; eleven leaves on small model and fourteen on large. One end rides free on hardened steel roller under frame. Front $2 \times 40\frac{1}{2}$ in., one end free riding on hardened steel roller under frame. Spring eyes are bushed to size, and fitted to heat treated oiler bolts.

Wheels are Bimel, 36-in. front and rear, with $1\frac{3}{4}$ -in. square spokes of second growth

hickory, with extra heavy felloe and large flange. Both sets of brakes operated on rear wheel drums; $18 \times 2\frac{1}{2}$ in. on the large, and $16 \times 2\frac{1}{2}$ in. on the small model.

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Control, Equipment, Etc.

Control is by right side steer and center gear shift, gasoline throttle lever on steering column and foot accelerator. A 17-gal. gasoline tank is carried under the seat.

Equipment consists of seat, gasoline tank, front fenders and running boards, three oil lamps, complete set of tools, tool box, horn and jack. The large model sells at \$2100, and the small one at \$1900.

The Kalamazoo Motor Truck



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Motor

The power plant is a four cylinder Rutenber, $3\frac{3}{4} \times 5\frac{1}{4}$ in., and cast en bloc., developing 30 h.p. Cylinders are made of semi-steel gray iron, and carefully ground to size, leaving a gloss finish. Crank case is aluminum, scraped and finished in the natural color. It is made in two halves, the upper half for holding the crank shaft, bearings and caps, and cam shaft, all in position; the lower half contains the oil reservoir and is easily removed for adjustment of crank and connecting rod bearings. Valves are exceptionally large in diameter, and heads are $3\frac{1}{2}$ per cent. nickel steel, electrically welded to carbon steel stems. They are provided with long guides, which may be removed from the cylinder and replaced whenever necessary. The three-bearing type crank shaft is drop-forged from 40 point carbon open hearth steel, properly treated, carefully balanced on parallels. Both crank shaft and connecting rod are of a special alloy. Hoyt's nickel babbit, die cast, and provided with large oil grooves and heavy flanges.

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The Kalamazoo Motor Truck

Four-cylinder Rutenber motor; Covert sliding-gear transmission, and chain final drive

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The front axle is a one-piece drop forging of very heavy I-beam section. The rear axle is rectangular in section, $1\frac{1}{4} \times 2\frac{3}{4}$, forged from a single piece of special steel. The spindles carry Standard roller bearings, with solid rollers, and races and cones made of special steel, with temper drawn, so that they are very tough and will not chip or break under severe service. The rollers offer a line of contact throughout their length, giving bearings great radial load and end thrust capacity.

The wheels are 36 in. in diameter, have fourteen 2-in. spokes, and are made of second growth hickory. The hub flanges are $10\frac{1}{4}$ in. in diameter. The brake drums, to which the rear sprockets are riveted, are fastened to the wheels by a belt through each spoke.

Frame is made of special cold-pressed steel, $\frac{3}{16}$ in. thick; the side members are $4\frac{1}{2}$ in. high, $2\frac{3}{16}$ in. wide. Five cross members are thoroughly riveted and heavily gusseted. The frame is $173\frac{1}{2}$ in. long, and extends the entire length of body.

Other Details

Steering gears, heavy type, worm and sector gear, adjustable large hand wheel is placed on right side. Standard tire equipment 36×3 in. front and 36×4 in. rear, solid flange type.

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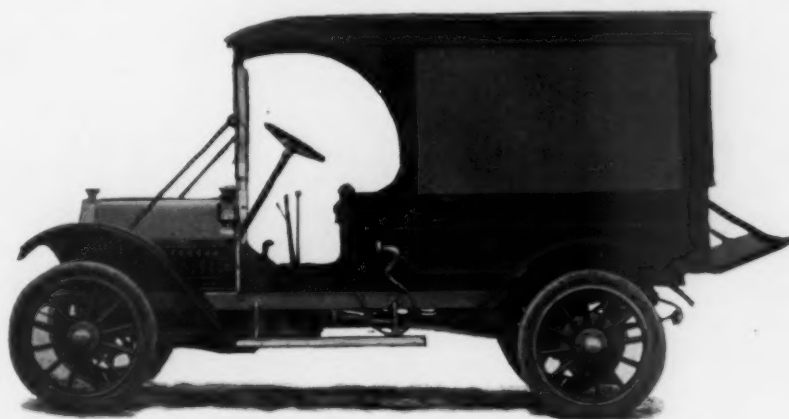
One of the difficulties which has been found in the light delivery field, has been overcome by the use of an ample sized radiator, the core in which is 3 in. in depth. The water passages are of the vertical tube type, but the front of the radiator has the appearance of the square tube construction. This radiator and piping hold approximately $3\frac{1}{2}$ gals. of water. The cooling is also assisted by a three-blade fan of propellor construction.

Accessible Gear Box

The sliding speed transmission is a unit with the motor, fastened to the same by a

bell housing. This places it in an equally accessible position as the cover comes directly under the floor boards. Both the gears and shafts in this transmission are made of $3\frac{1}{2}$ per cent. nickel steel. The enclosed cone clutch has a maximum diameter of $13\frac{1}{8}$ in.

been one which has been sadly neglected in many light jobs of the past. The shortcomings in this direction have been felt because of the exceptionally heavy service the brakes get in this kind of work, as stops are made in this line as many as 300 in a day. On this car sufficient braking surface



Side View of Kosmath One Thousand Pound Delivery Wagon
Four cylinder $3\frac{1}{2} \times 4$ in. motor; cone clutch; three speeds forward; three-quarter floating Weston-Mott rear axle. Price, \$900, express or panel body

Four-to-One Reduction

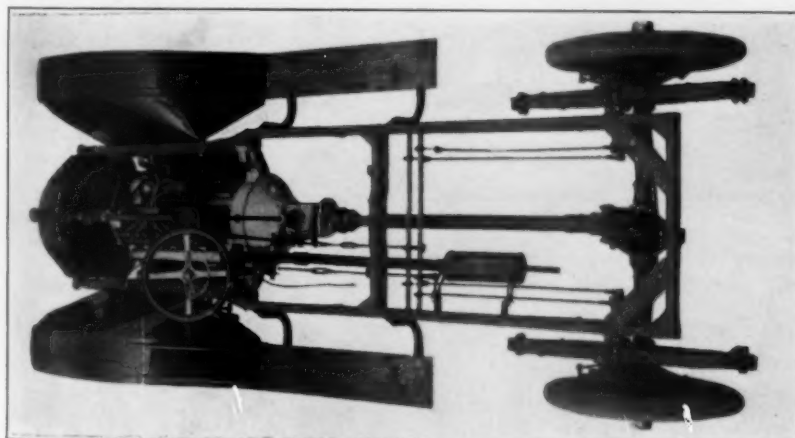
The drive is taken from the universal joint and slip joint at the rear of the gear box, through an enclosed shaft to a three-quarter floating Weston-Mott axle. The bevel gear reduction of the axle of 4 to 1 gives, with 32-in. wheels and a motor of 1000 r.p.m., a car speed of approximately 23 m.p.h. The motor, however, is not limited to this speed, as no governor is fitted, except as extra equipment when required. Although the mass to be retarded in a light delivery job is nowhere near as great as in a heavy truck, the problem of supplying sufficient braking service, has

is provided by drums of 14-in. diameter with 2-in. face. The service brake bands are external contracting, and the hand-brake is of the internal expanding type.

Other parts which get undue punishment in small capacity trucks, due to the excessive overloading which some owners insist upon indulging in, are the wheels, frame and axles. In the case of the Kosmath construction, these have been taken care of under the following specifications: The frame is of course of channel section, and $4\frac{1}{2}$ in. deep. The wheels are of twelve spokes, each of $1\frac{3}{8}$ in. diameter. The front axle is a drop forging, of the I-beam shape, with $3\frac{3}{8}$ in. depth and $1\frac{1}{2}$ -in. flanges. In the rear axle Hyatt heavy duty bearings take care of the loads. The drive from the rear axle to frame is through two long radius rods, which are hinged at the forward end. This allows for full elliptic springs, shackled at both ends with a master leaf 36 in. long by 2 in. wide. The front springs are semi-elliptic, 38×2 in.

Left-Side Steer

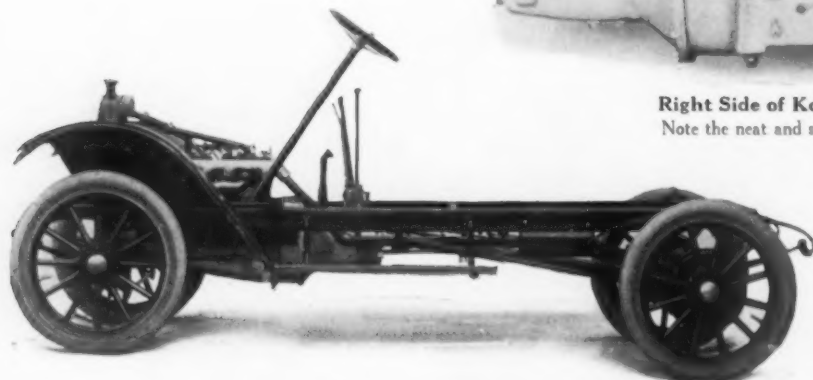
Following the constantly increasing school of left-side drive, the steering wheel is placed on that side, and the control and brake levers are in the center. However, easy access is given from the right-side step, and this not only makes for easy delivery when the driver is alone, but in case a package boy is carried. He is on the curb side, where very quick action can be expected. Because of the not too great skill of the usual delivery driver, the control mechanisms have been reduced to their simplest terms. The carburetor is controlled entirely by a foot throttle, while



Plan View of Kosmath
Clean cut, well designed, and substantially constructed

fixed spark eliminates any spark adjustment on the part of the driver.

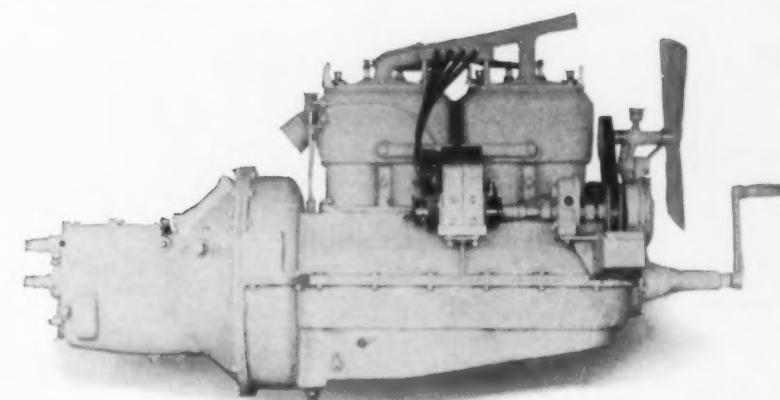
The open express body has an inside floor space of 67 x 44 in., and the enclosed panel job has the same area, with a clear height of 54 in. The 110-in. wheelbase allows for a very moderate overhang this not exceeding 30 in. from the center line of the rear axle. The overall length of the car is approximately 11 ft. 6 in. Taking the floor area and converting it into sq. ft., the figure comes to 20½. This, at the rated capacity



Elevation of Kosmath Chassis

of 1000 lbs., gives a load ratio of 49 lbs. to a sq. ft., a very conservative figure which means that larger loads than the rated capacity can easily be carried. Although the ratio per sq. ft. is slightly less than in the majority of cars in this class, there should not be fear of excessive overloading, as the car is of exceeding sturdy construction, and any right-minded owner would see that the amount of space at its disposal was not continuously abused.

The standard equipment calls for pneumatic tires 32 x 3½ in., but in case larger tires are desired, 33 x 4 in. pneumatics will be fitted at an extra charge of \$25. The weight of the whole car, ready for delivery, is approximately 2400 lbs.



Right Side of Kosmath Unit Power Plant
Note the neat and staunch construction throughout

SOME RECENT LARGE TRUCK SALES

Current sales of motor trucks reported by the White Company, of Cleveland, Ohio, include twenty-three trucks sold to department and drygoods stores, giving the White Company a total of over six hundred trucks in the service of one hundred and fifty leading retail establishments.

The New York firm of Saks & Company joined the White army with an initial order for ten trucks; Lord & Taylor bought a dumping truck; the G. M. McKelvey Company, of Youngstown, Ohio, which has used a White truck for nearly a year and a half, placed a repeat order for five trucks,

and the May Company of Cleveland, which has had four Whites in service for the past ten months, increased its equipment to eleven trucks.

Another sale of this company is that of three five-ton trucks to the Good Roads Company, contractors, of Baltimore, Md. These trucks will be built with power transmission tank bodies for sprinkling and spreading hot tar and other road-binding materials. The tank bodies will be built with a steam generator, and a series of interior steam pipes for maintaining the tar in the proper state of fluidity and the power transmission will operate an air compressor to force the fluid through the passages to the spreading outlet.



Commerce Dog Wagon for Detroit

It is used by the Detroit Police Department, and has a special body, which is partitioned by lattices, giving a number of individual compartments, available through doors on sides and rear. It is the product of the Commerce Motor Car Company, Detroit.

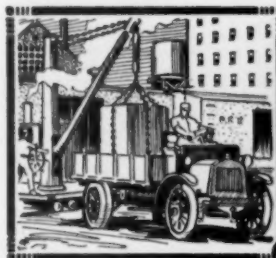


New Velie One-Tonner

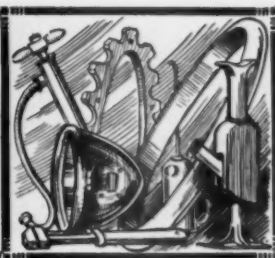
Gray & Davis electric lights and starter; Bosch magneto; Stromberg carburetor, and demountable rims. Tire equipment is either pneumatic or solid in rear, and pneumatic in front, at purchaser's option. Chassis price, \$2000. The car is offered by the Velie Motor Vehicle Company, Moline, Ill.

Babcock's Attleboro Express is operating a Peerless three-ton truck on a fixed schedule between Attleboro, Mass., and Providence, R. I. It formerly required twenty-five horses to do the work which is being done quicker and more satisfactorily by this truck. While there is ample trolley freight, express and railroad service between the two towns, the rates have been high, and the necessity of packing goods carefully, as well as the fact that such shipments usually require more time, have led to the practice of hauling a large amount of freight over the roads.

Toledo will spend \$200,000 for motor fire apparatus. The Safety Director has been authorized to advertise for bids.



TRUCK ACCESSORIES AND APPLIANCES



SPEEDOLENE AND ASBESTOLENE

Speedolene Lubricant Company, 14 James Street, Malden, Mass., is offering two new lubricants.

Speedolene is a comparatively new lubricant to the American market, as used in automobiles, motor trucks and motor boats. It consists of a high grade steam oil retained by the tough, silky fibre of asbestos. The fibre causes the mixture to everlastingly stick to the gear teeth, and at the same time renders a cushioning property, which is claimed to silence all noise in transmissions, differentials, worm gears, timing gears and enclosed chain drives, without gumming up or packing away. Its asbestos resistance to heat has many advantages. Speedolene will thoroughly lubricate all flat, ball and roller bearings. It contains no acid or silica or other injurious ingredient to metal. Speedolene is used in two consistencies, light and heavy.

Asbestolene is used on heavy gears, chains or cable in mills, etc., where it is desirable to stop noise and give perfect lubrication. It is made up of the same ingredients as "Speedolene" except that a cheaper grade of oil is used.

THE NATIONAL SPECIAL TIRE

These tires are the product of the National Rubber Company, Pottstown, Pa. The feature of this tire which recommends it for municipal service vehicles, ambulances, fire-apparatus, etc., is the fact that it has a specially reinforced carcass with nearly double the layers of fabric on the tread and the standard number of layers on the side walls. This reinforced construction makes it practically "puncture" and "blow-out" proof and gives many times the strength of the ordinary tire at the spot where the strength is most needed, without taking away from the flexibility of the side walls.

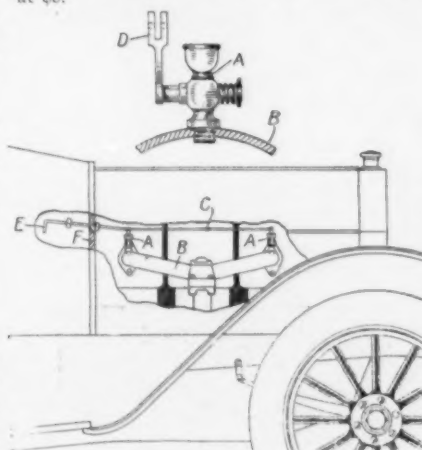


Section of National Special Casing

This tire is made of pure fine up-river Para rubber and the best selected long staple Sea Island cotton.

THE ECONOMY AIR ACCELERATOR

This device, to act as priming cups in starting a cold motor and to give greater mileage on gasoline, is being placed on the market by the B. H. Kamp Motor Company, Mount Carmel, Ill. The priming cups inserted in the intake manifold are operated by the throttle and feed air directly into the manifold. The air mixes with the vaporized gasoline, and gives a more economical mixture. The device sells at \$5.



Economy Air Accelerator

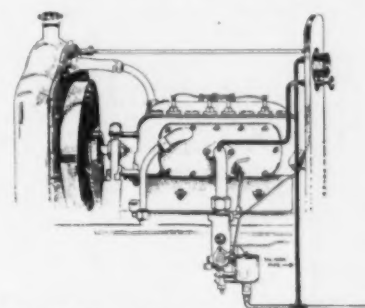
Showing also manner of attaching the device to intake manifold

THE BOSCH SPARK-PLUG HOOD

Another step toward eliminating trouble in the ignition system is this new Bosch product. The attachment consists of the Steatite hood and the insulated cap. The hood has asbestos packing on its lower surface, so that a moisture-proof joint is formed when the hood is placed over the regular spark plug. The hood has a groove in its top, so that the cable can be laid in the groove, with the loop terminal encircling the central pin of the plug. The cap, which is insulated, and can be removed without electrical shock, is screwed onto the thread on the plug's central pin. When tightened, it bears down on the hood, preventing moisture from entering the cable groove and also holding the parts tight, preventing vibration and rattling. The hood sells at 45 cents and can be obtained at supply stores and all Bosch branches.

THE "WEBB JAY" SUCTION PRIMER

To facilitate starting is the purpose of this device. As the cut shows, this device, 2½ in. in diameter and highly nickeled, is attached on the dash and attached to the fuel line and intake manifold by 3-16 in.



The Webb Jay Suction Primer in Place

pipng. In operation, when stopping the motor, the priming valve is opened wide, then the switch turned off and the priming valve closed. The result is that a rich priming charge is drawn into the cylinders, which remains there ready for the next start. It saves time, labor, money and temper.

This device is being placed on the market by the Motor Devices Company, 2635 Wabash Avenue, Chicago, Ill. With all fittings it lists at \$6.



The Bosch Spark-Plug Hood
Being fitted over the plug insulator. It simply drops into place

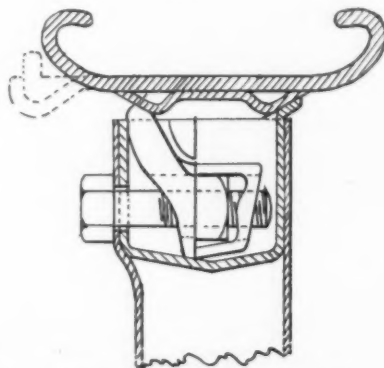
THE NEWMASTIC NO-FELLOE PRESSED-STEEL WHEEL

The No-Felloe Pressed Steel Wheel, made by the Newmastic Company, 68th and Broadway, New York City, is a new-comer and is entirely novel in construction. It is made in two halves which, when put together, have the shape and appearance of ordinary wood spokes and fit into an ordinary wheel hub but have no felloe. These two halves are welded together and the end of each spoke receives a small pressed steel cup, bolt and a clip. The tire carrying channel or rim has on its under surface two annular grooves very similar to the grooves found on Firestone and Goodyear demountable rims. The clips on the end of the spokes are designed to grip these annular grooves with great pressure as each bolt is tightened. It is claimed for the pressed steel wheels that they are very strong and that they do not dry out, shrink or become loose.

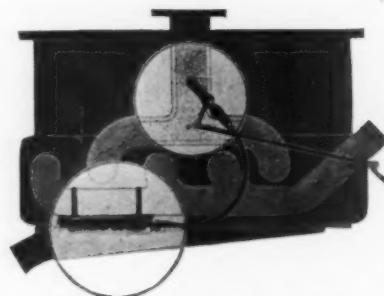


No-Felloe Pressed-Steel Wheel

The rim is attached by clips to the end of each spoke



Sectional View of the No-Felloe Pressed-Steel Wheel



Motor Fuel Conserver Applied

to exhaust gases.) A flexible tubing $\frac{1}{4}$ in. in size connects inner chamber with cut off valve, which is attached to motor 2 or 3 in. above carburetor.

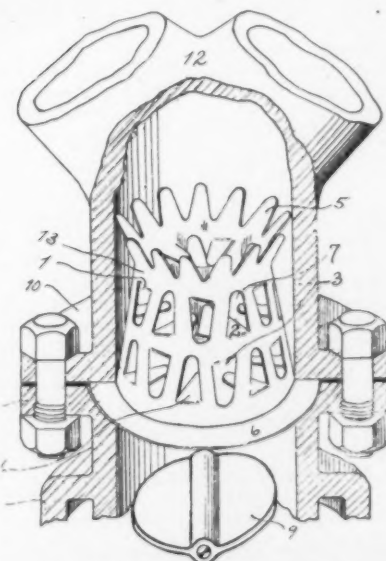
The Fuel Conserver is easily installed by drilling a 11-32 in. hole in manifold and using a $\frac{1}{8}$ -in. tap, standard pipe thread, and then inserting valve. The lever on valve is connected to plunger control button on steering column by means of rods, similar to throttle rods used for opening and closing throttle on carburetor. (When attaching, a $\frac{5}{8}$ in. hole is drilled in dash for control rod.) The Fuel Conserver is operated from driver's seat by a slight touch of the finger tips on control button. Heated air being drawn into compression chambers of motor by the suction of pistons reduces the amount of gasoline that otherwise

would be taken into motor. The heat mixing with vapor in manifold expands gases and vaporizes the fuel so thoroughly that motor picks up speed, even under load, thereby giving an increased power on less fuel consumption. The device is the product of the Motor Fuel Conserver Company, 1019 Dime Bank Building, Detroit, Mich.

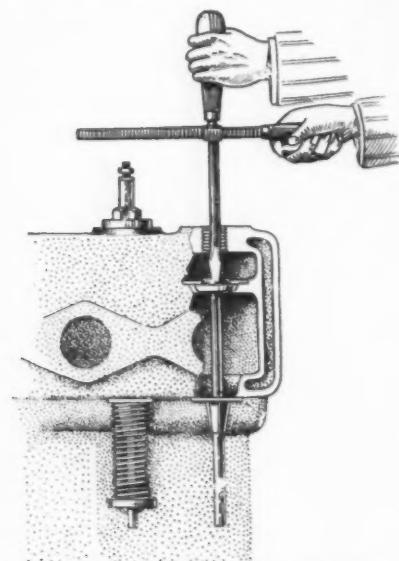
THE ROYAL-SILENT VAPORIZER

The Royal-Silent Motors Company, of Los Angeles, Cal., has recently placed on the market a fuel vaporizing device which is designed especially for vaporizing heavy oils, kerosene, distillate and the poorer grades of gasoline. High fuel saving records are claimed to have resulted in connection with the use of the device.

The illustration shows the Royal-Silent Vaporizer installed, with tilted tongues, some slanted upwards and others downwards. The mechanical action causes the raw spray to rotate in, first, a rotary and converging or compressing manner, by row of tongues marked 4. It then passes between row 5, which rotates it outwardly, portions of gas having to escape through the openings adjacent to the tongues. The row of tongues marked 3 again repeat the action of lower row number 4, rotating and compressing centrally and finally row number 2 whirls the spray outwardly, part passing through the side openings and then past outer row number 1, which has very sharply tilted tongues that twist the gas into a rapidly swirling column. The various currents are further multiplied, as the tongues do not quite meet, thus leaving a free central space, through which a sufficient amount of spray escapes with such rapidity as to cause a violent vacuum, which multiplies and agitates the whole order of regular currents, identical to the action of a powerful whirlpool. It breaks up the spray to a perfect minute vapor. This mixer and vaporizer sells at \$3 for all sizes and can be installed between the carburetor flange and intake pipe very readily.



Royal-Silent Vaporizer Installed



Monarch Valve Grinder in Use

THE UTILITY COMPRESSOR— SOMETHING NEW IN COMPRESSORS

Six hundred lbs. pressure with .65 h.p. from a machine 5 in. in diameter, 13 in. in length, and weighing about 23 lbs. is certainly something new in air compression. The Utility No. 1, an eight-cylinder, 1-in.



The Utility Air Compressor

bore compressor, produced by the Utility Compressor Company, 355-63 Harper Avenue, Detroit, Mich., has shown these results, and the economy resulting from this exceptional increase in efficiency is so great as to give promise of a large adaption.

In designing this pump, the inventors have endeavored to embody in one unit, minimum friction, compactness, uninterrupted flow, standardized parts, a mechanical construction providing for the taking up of wearing parts, and dash system of oiling to automatically lubricate all wearing parts.

The machine is air cooled and rotary driven, the rotary motion being converted into a reciprocatory motion of the eight pistons by a conical connecting rod which is pivoted on a universal joint of sufficient strength to take the entire end thrust of the pistons. The smaller end of the connecting rod is engaged in the rotary driving arm a sufficient distance from its center to permit of a 1 5-16 in. stroke in the piston. This imparts a circular, wave-like motion to the conical connecting rod and delivers the power in turn to each piston, there being about a 1/4-in. lead between the pistons, thereby giving a continuous flow of air and a steady pull on the driving arm.

The rotary driving arm has a counterbalance weight to offset the conical connecting arm and eliminating vibrations—also a small blade which dashes the oil over all parts.

There is but one discharge valve for each cylinder—all mounted in one plate. The valve is cylindrical in shape, having a soft face against a hard seat. They are not ground, but peened, and by a very simple arrangement are held in a fixed position as far as rotation is concerned. They lift only .01 in. off their seat, making a noiseless valve and also eliminating all possibility of hammering. The valves are large and of sufficient length to almost preclude any wear in their retaining chamber. By removing eight cap screws, the head and the valve plate can be removed, and should any of the valves become leaky, they can be made as good as new by a few light taps with a hammer.

The intake is through a stationary port which is cut in all the cylinders in one operation. The pump proper consists of four semi-steel castings. The cylinders are cast en bloc. The rotary driving arm and the conical connecting rod and pistons are open hearth steel, the first two being drop forged, heat treated and tempered. There are two cast iron piston rings to each pis-

ton. The main rotary driving arm has a die cast, nickel-bronze, removable bushing of ample size to insure long life. The connecting rods are about 2 3/4 in. long and have a 3/4-in. hardened ball at each end, and, in its entire travel the free end moves but about 1/8-in. out of the straight line, thus reducing wear on the piston end and insuring a straight push of the power applied.

The compressor in operation is exceedingly quiet, the large number of cylinders eliminating all puffing sound, and giving a low purring sound instead.

From a manufacturing standpoint all parts when finished are round, thereby permitting nearly all of them to be made on automatic machinery. This gives speed, accuracy and economy in manufacturing.

THE VOTEX GASOLINE SAVER

This is an instrument to be fitted in the inlet manifold of the gasoline motor just above the carburetor. It is entirely automatic in its operation, delivering a certain amount of air to the imperfect mixture,



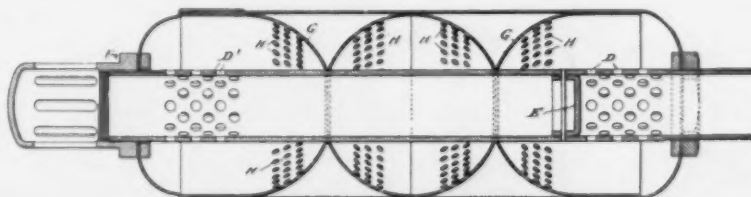
The Votex

said to be received from the carburetor, as may be required according to the engine speed and position of the throttle. The Votex is about the size of a small watch and is easy to install and fits any gasoline motor.

In use, when the engine is running idle, the throttle is practically closed and the engine is acting as a suction pump, causing a high vacuum in the intake manifold. Under these conditions, the mixture is stronger than necessary, and the Votex allows a very small amount of air to enter the intake manifold, partially relieving the suction and weakening the mixture. When the throttle is opened quite wide, the vacuum in the manifold is relieved, and allows the Votex to close, thus a comparatively strong mixture which gives ample power for quick acceleration, is fed to the cylinders. When the motor gets up to speed, the throttle is closed down, and a very high vacuum is again created in the manifold, thus allowing the Votex to open and feed a quantity of air to the cylinders, weakening the mixture to the economical point. The device is the product of the Sireno Company, 18-20 Rose Street, New York City, and sells at \$3.50 in nickel plate.

A NEW JASCO MUFFLER

Janney-Steinmetz Company, 4th and Market Streets, Philadelphia, Pa., is offering a new muffler, having, it is claimed, unusual compactness and efficiency. In the accom-



Sectional View of New Jasco Muffler

panying illustration the exhaust gases from the engine enter at the right, the diaphragm E preventing its further continuance through the tube, and the gases pass through the perforations D into the hemispherical cup G. It then passes out through the perforations H, but before it does, it expands, radiates and performs work by pushing the cup G against its companion, in this way much of it being expended. After passing through the perforations H, it enters the angular chamber between the first and second cups, this chamber having very great radiating surface in comparison with its capacity. Thence it passes into the approximately spherical chamber formed by the next two cups, and then out of it into a second angular chamber, and through perforations H into the last cup, through perforations D, and out the slots F. The end walls of the muffler can be adjusted by means of the nuts, upon which they are mounted, and which travel on the inside tube.

THE V-RAY "MIKA" SPARK PLUG

A fitting running mate of the V-Ray porcelain plug is the latest product, the "Mika" plug. Their secret process, it is stated, renders "Mika" distinctly different and better than commonplace mica which, in the past has been regarded with skepticism by some because of the tendency of ordinary mica to soak oil and disintegrate under excessive heat conditions.



Cut-Away Section of V-Ray "Mika" Spark Plug

It is claimed for the latest addition to the V-Ray "family" that their "Mika" plug will positively resist,—will be absolutely impervious to heat and oil. With this new adjunct, which has only been adopted as standard after thorough experimentation, the V-Ray company confines its line to its staple porcelain plug and this attractive new plug, the "Mika," a sectional view of which is shown herewith. The new "Mika" core interchanges perfectly with the Mica Lava plug formerly made by the V-Ray Company, of Marshalltown, Ia.

NEW KNOX TRANSMISSION SHOWS MANY UNIQUE FEATURES

Knox Automobile Company, Springfield, Mass., has patented a transmission, in which all the bearings, shafts and gears can be removed as a unit, and still be in operative relation to one another. This is an advantage, as the unit can be removed for repairs and thoroughly adjusted before being placed back in its case.

The invention comprises a single casing in which the differential gearing and the transmission gearing is mounted. All the shafts of the transmission gearing have suitable bearings in two head members between which members a cage like supporting frame connects. With all the shafts provided with bearings in the two heads of this frame-like structure, the casing is so constructed that the frame structure, together with its shafts and their gears, may be placed in the casing in suitable supporting surfaces. With this construction the two head members and the connecting frame can be removed from the casing or placed therein at will, and whether in the casing or out of it, the transmission shafts with their gears being supported by the head members can turn in their bearings and the transmission gearing can be operated at will.

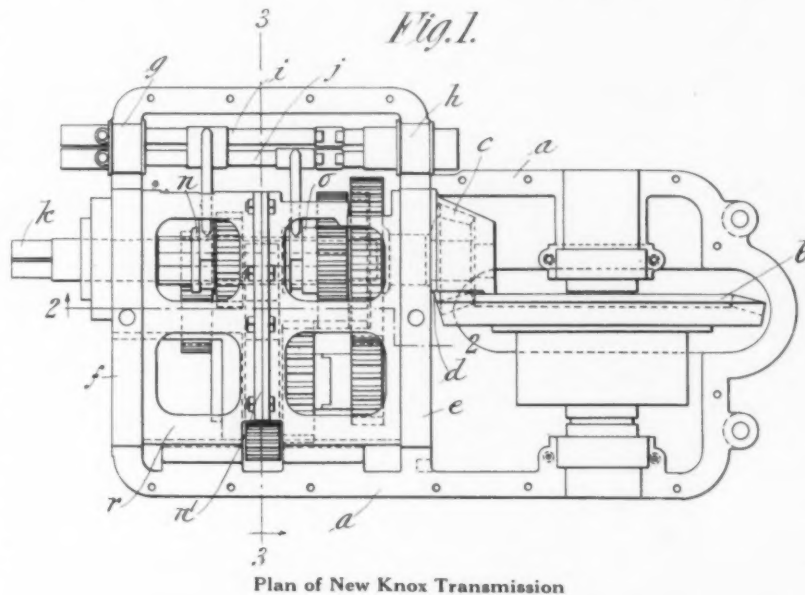
Referring to the drawings, in which like reference characters refer to the same parts throughout the several views, Fig. 1 is a plan view of the assembled transmission gearing, differential gearing and shifting rods for said transmission gearing, all in place in the lower half of the casing adapted to contain said parts. Fig. 2 is a sectional view on the line 2-2 of Fig. 1. Fig. 3 is a cross sectional view through the casing and the transmission parts as assembled, taken on line 3-3 of Fig. 1. The upper and the lower half of the casing are designated by *a* (see Figs. 1 and 3). Suitable supporting bearings are provided in the casing *a* for the differential gearing *b* as indicated in Fig. 1. The gear shifting rods *i* and *j* are operated through supporting members *h* and *g*, which are provided with suitable registering surfaces in the casings *a* and *b*. These shifting rods have right angle extensions, extending to the clutches *o* and *n* of the transmission gearing.

The transmission gearing proper is supported in suitable bearings in the two head members *e* and *f*, which, as shown, are circular in form and fit into the casing to be bound therein by suitable fastening devices in a manner obvious from the drawings (see Figs. 1 and 2). Between these head members *e* and *f*, there is a connecting

frame *r* which, as shown, is provided with openings at various places either to allow certain of the gears to extend therefrom or to lighten the construction. The frame structure is made in two parts which are connected by the flanges *n'*, bound together by fastening devices. When it is desired to take the transmission mechanism out of the casing as positioned therein in Fig. 1 it is only necessary to remove the top half of

intermediate drive in one direction as well as a reverse drive. The main shaft *k* is squared, and has on one end the beveled gear *d*, which drives the differential gear *b*. In order to properly support this beveled gear *d*, an extension of the head *e* is provided, as at *c* which is cast on said head to form an end bearing for the shaft *k*.

With the construction described, it is clear that if it is ever necessary to over-



Plan of New Knox Transmission

the casing *a*, then lift vertically the supporting members *g* and *h* to free the members from the casing, and then move it horizontally so that the right angled forked extensions will leave the clutch members *o* and *n*. If the fastening devices for the head members *e* and *f* are now loosened, these members, together with the connecting frame *r*, and the transmission shafts with their gears can be lifted as a unit from the casing *a* and placed where desired. It will be noted that when the transmission gearing is thus lifted from the casing none of the parts thereof are disturbed in their relation to each other so that the transmission mechanism can be operated in the head members independently of the casing.

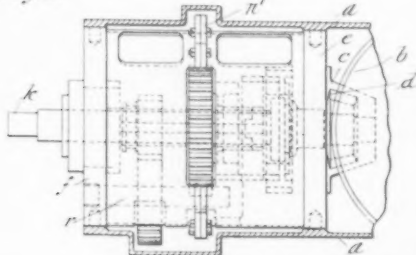
In the device shown, the transmission mechanism comprises a main shaft *k* (see Fig. 3), a counter shaft *l* and a reverse stud shaft *m* of the usual construction with the usual gearing held thereon to give a direct drive in one direction, a low drive and an

haul the transmission mechanism or adjust the same or repair it in any manner the same can be removed from the casing which ordinarily holds it, taken to a convenient place, and operated to find out where it needs adjustment or repairs, and, after such repairs are made, the transmission mechanism can again be operated to test and determine its accurate operation before it is re-inserted in its casing. This sort of a structure greatly facilitates both the assembling and the repairing of transmission mechanism ordinarily used in automobiles.

GARCO ASBESTOS BRAKE-BAND LINING

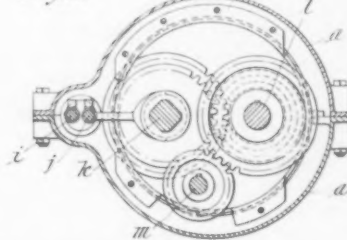
This lining is constructed of a high-grade asbestos metallic yarn and proofed with a special compound. The construction gives it a surface, that is particularly adapted for brakes, and the material is the best known to resist the heat, generated in the hard usage of this service. It is compact and strong, and will resist wear. It will not absorb water or oil, and is not affected by contact with same or with acids. The properties of this material, as well as the method of construction make it particularly adapted to the service for which it is intended. This lining is being placed on the market by the General Asbestos and Rubber Company, Charleston, S. C. The price ranges from 40 cents a ft. for 1-in. width and 1/8 in. thickness to \$2.20 for 4-in. width and 3/4-in. thickness.

Fig. 2.



Elevation and End Views of New Knox Transmission

Fig. 3.



LITTLEFORD STEEL TRUCK BODIES

Realizing the rapidly increasing demand for all steel bodies for automobile trucks, Littleford Brothers, a well-known Cincinnati, Ohio, concern has determined to enter the field. Littleford Brothers is an old and well established concern, having been in the sheet steel and iron working business since 1881. During the last few years they have manufactured steel bodies for quite a number of automobile truck makers in and around Cincinnati, and their work has proved to be such a success that they have determined to expand their efforts and develop this branch along with other lines of their business.

Although the Littleford steel body is just being introduced to the automobile public, it is by no means in the experimental stage. Originating three years ago in a shop where the working of sheet metal is the chief industry, it has grown and been developed by men thoroughly familiar with this line of trade into a particularly well designed, durable and attractive article.

In designing this body the first consideration has been strength and efficiency. No superfluous weight has been added, nor has the strength of the whole been impaired in order to reduce weight and save material. The body proper is made of wide sheets of heavy steel, neatly formed up to shape and securely riveted to rigid stiffeners. In this particular, it may be said that this is especially well designed. The company has realized the importance of a substantial framework and the unsightly appearance of a body with its sides and ends bulging from the internal pressure created by the load, and has built the bodies in a framework which gives perfect assurance against any such calamity. The stiffeners are of rolled forms, closely spaced and encircle the entire body. At all points where they cross the channel subframe, they are attached to it with heavy forgings.

The riveting on these bodies has been given especial attention and combines with

the whole in its general appearance of strength and durability. The rivets are equally spaced and are exceptionally close. They are all carefully driven into countersunk holes on the inside with a button head on the outside of the body, thus adding to the general neatness of appearance. The inside of the body is smooth and perfectly free from any obstructions, thus facilitating the dumping and cleaning of the body and also presenting no weak spots or points that will be subjected to excessive wear.

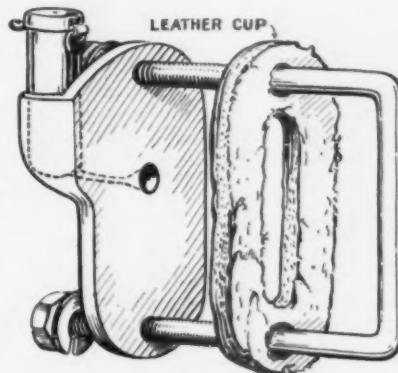
The appearance of this body is a point which the manufacturers have carefully watched. It is constructed throughout by the best skilled labor and every effort is made to keep it free of any hammer marks, nicks, etc. All corners are carefully rounded, so that the finished article is exceptionally clean cut and pleasing to the eye as well as being thoroughly workmanlike and substantial.

In designing the minor features of this body such as the tail gate, tail gate latch, etc., no particular principle has been adhered to. The designers have worked out a number of clever features in this line and present them to the purchaser in catalog form in order that he may select the style which is particularly adapted to his purpose, and consequently get perfect satisfaction. The fact that every truck manufacturer's requirements are different has been realized, and Littleford Brothers have provided accordingly. They are equipped to manufacture steel bodies of any special design.

THE GRUS LEAF SPRING OILER

This device, to lubricate the leaves of automobile springs, is very simple and readily attached. As the cut shows, it consists of a malleable iron plate, which has at its top an oil cup, and a duct through the plate to its inner surface. The plate is attached in a vertical position one-third the distance from the center of the spring, regardless of

the leaf arrangement. It is held in position by a clip passing around the spring and held by nuts and washers on the outside surface of the oiler plate. A leather cup, whose center is cut out, as shown, is interposed between the oiler plate and the sides of the spring leaves.



The Grus Spring Leaf Oiler

The reserve cup holds sufficient lubricant for a week's use

The oil cup holds sufficient engine oil, which is to be used, for a week's ordinary usage. The oil works in between the leaves from the leather cup. As the leather cup wears, the clips are tightened, and the leather cups may have to be renewed once a year. The oilers are made in sizes from 1 to 2 1/4 in., this dimension being the thickness of the spring at the point of application. The device is the product of William Grus, Jr., & Company, 5213 Wayne Avenue, Chicago.

RIDE-OVER SPRING LUBRICATORS

Avery, P. L. Company, Jackson Street, Milwaukee, Wis., has brought out a new method of lubricating spring leaves on motor trucks, consisting of thin strips of graphite which are slid between the leaves.

This outfit consists of fifty strips of graphite and a tool for separating the leaves. They give lasting lubrication and easy riding and quiet springs. A box of fifty sells at \$1; a leaf separator is furnished with it at \$1.50.

NO MORE RUST RIM PAINT

One of the most valuable articles for the motor car owner is a good rim paint because much time, temper and labor are consumed by car owners in the changing of tires from time to time, and especially is this true in the summer time when blow-outs are most frequent, due to the air in tires, which expands under summer heat.

The Atlas Auto Supply Company, of Chicago, Ill., manufactures No More Rust Rim Paint. The manufacturers state that when rims are painted with No More Rust Rim Paint the tire will slip on and off with one hand. No More Rust Rim Paint is applied with a brush in a few minutes' time, and, besides preventing casings from rusting to the rim, it also prevents inner tubes from rusting where exposed to the rim.

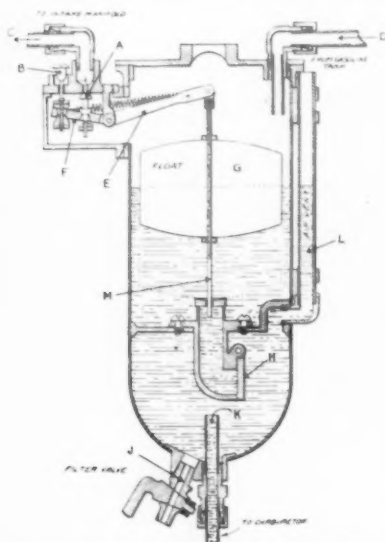


Littleford Steel Truck Body
This is a four-ton coal hauler

THE STEWART-WARNER VACUUM GRAVITY GASOLINE SYSTEM

A third type of gasoline system, said to have advantages over the two systems now in use, is being brought out by the Stewart-Warner Speedometer Corporation.

This system provides a gravity feed to the carburetor float chamber at all times and allows for the designing of bodies as low as desired. It consists of a small tank placed on the motor side of the dash, or directly on the engine where the base admits of a bracket to hold it. One lead connects with a gasoline tank in the rear, and which tank need not be of air-tight construction; neither need the filler cap be a tight fit, as an open vent is necessary on the rear tank. The outlet from the Gravity Vacuum tank to the carburetor need be but 3 in. above the top of the float chamber in the carburetor, which means that the carburetor can be installed



Sectional Diagram of Gravity Vacuum Tank of Stewart-Warner Gravity Vacuum Gasoline System

close against the intake manifold,—a position where carburetion is benefited by reason of its getting the heat from the motor, and also a position where it can be readily and easily gotten at for purpose of adjustment.

The Gravity Vacuum Tank consists of two chambers, the upper one the filling chamber, and the lower one the reservoir, holding about one quart of gasoline in reserve at all times. The filling of this Gravity Vacuum Tank is accomplished by tapping the intake manifold at a point nearest the cylinders. The suction of the intake draws the gasoline from the gasoline reservoir in the rear of the car into this Gravity Vacuum Tank. This draws but 1/24 of a gallon at each float operation. The amount of air thus displaced makes no difference whatsoever with the gas mixture in the motor. The gasoline, being sucked up into this small tank, operates a float valve. When this valve has risen to a certain mark it automatically shuts off the suction of air and opens the tank to atmospheric conditions. The lower chamber is always open to atmos-

pheric conditions, so that the filling of the upper chamber in no way interferes with the supply of gasoline to the carburetor.

The above description may be better understood by referring to the accompanying diagram. C is the line to intake manifold. While the drawing does not show it, there is a small check valve located in this suction line, just above the valve A. D is the line to the gasoline supply reservoir at the rear of the car. A is the suction valve for opening and closing the connection from the intake manifold, and through which the vacuum is forced. This is shown as closed. B is the atmospheric valve and is shown as open. It is impossible to have both of these valves A and B, open or closed at the same time. No particular adjustment of these valves is necessary, in that opening the suction valve from 1/32 to 1/4 in. will not affect its operation, showing that fine adjustment is not necessary. G is the float in the upper chamber, which regulates the operation of these valves A and B. It is now shown in its top position, just when the upper chamber has been filled with gasoline, and the suction valve is closed while the atmospheric valve has just opened. The gasoline is now flowing from the upper chamber into the lower chamber through the trap valve H. The gasoline in the upper chamber is always under atmospheric pressure, due to the air vent L which is always open. The suction in the top chamber of the tank in no way interferes with the continual, even flow of gasoline to the carburetor from the lower chamber because of the suction closing the valve H tight, while the upper chamber is being filled.

As the gasoline in the upper chamber flows into the lower chamber, as soon as the float reaches the lowest position, the lever E has lowered to such a position that it actuates the valve lever F, and this in turn closes the valve B against the atmospheric pressure and again opens valve A when the suction from the intake manifold again commences to draw the gasoline from the tank in the rear of the car.

The connection to the carburetor is through the line at K. This extends 1 in. above the bottom of the lower chamber of the tank, for the purpose of preventing water or sediment from getting into the carburetor. This water and sediment is drawn off through the filter valve J. This filter valve J is also very convenient in case one wants to get gasoline easily for such purposes as priming the cylinders, cleaning purposes, etc. Should this tank be entirely empty, it requires only three to five turns of the motor with the throttle closed to draw enough gasoline into the tank to start the motor.

The only time that the suction from the tank shows any effect on the speed of the motor is when the engine is turning over idle at a slow speed, and then a very slight change only will be noticed. Under normal conditions the suction valve is open about 2 seconds.

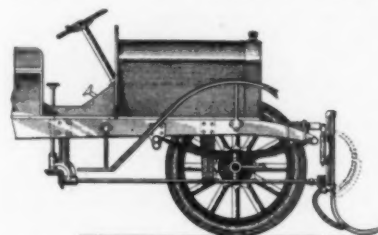
As regards the possibility of the suction carrying gas into the engine manifold, less than a teaspoonful has been drawn with the engine running under a load for one hour. This amount of gasoline is due to what little saturation there might be of the

air, because of its coming in contact with the gasoline. Under normal conditions the gasoline pressure in the carburetor varies only 1/4 of an ounce.

There is no danger of either the suction valve or the atmospheric valve sticking in their seats, as the small lever or bar to which these valves are attached travels about 1/4 in. above, and strikes the valve in its way, which prevents any tendency there might be for the valve to stick. The springs attached to the levers are made out of No. 28 gauge bronze, and have a stretch of only 3/8 in. so that the springs should last a lifetime.

THE "COMMERCIAL" SAFETY AUTO FENDER

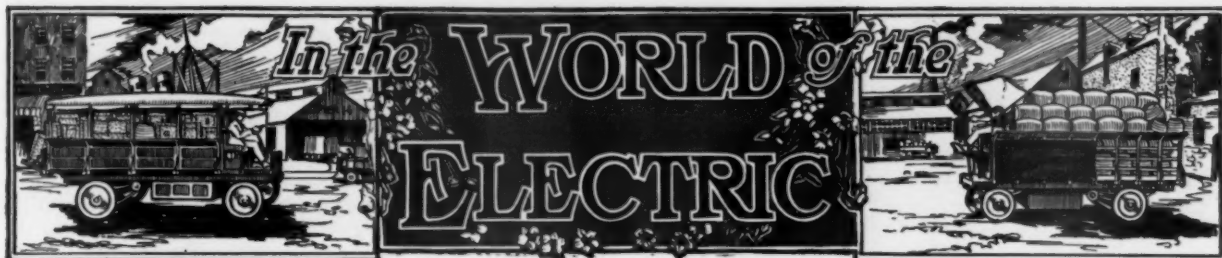
The Automobile Fender Equipment Company, 311-30 N. Dearborn Street, Chicago, Ill., has perfected and is placing on the market a truck fender, as shown in the accompanying illustration. The features include such conveniences as quick detachment and swinging or opening out so as to permit complete access to a machine for inspecting, repairing or cranking; outside of



Side View of "Commercial" Safety Auto Fender

this, the design is strictly an appliance that will prevent the machine or wheels from running over any one that is unfortunate enough to be struck and knocked down in the path of the car, and through its strong, substantial back frame, it gives a person an opportunity to catch or hold on to and receive protection until machine can be stopped. By using the best of seamless steel tubing, 1/2 in. fillers, 3/4 in. frame with 1-in. supporting back frame, which is directly connected with the machine by two strong hinges and having the front rod that runs close to surface incased with rubber tubing the best construction is insured. A fender should be attached so as to keep within 6 in. in front of the wheels and there is no necessity for a projecting member to extend beyond 18 in. in front of the wheels, and by easy manipulation from the driver's seat, the fender can be adjusted to meet all road conditions and provide a road clearance of 10 to 15 in., if found necessary. This is accomplished by folding the fender by driver's control and is done easily and quickly. It retails at \$40 in black enamel finish.

This device is made in two sizes, No. 1 for trucks built on the order of the White, Chase, G. M. C., Le Moon, Buick, Mack, Federal, etc., and No. 2 for the Standard, Kelly, Packard, Alco and other large trucks.



The Electric Vehicle in Parcel-Post Service for Economy and Reliability

THE Electric Vehicle Association of America, having the co-operation of the National Electric Light Association, proposes to render such collaboration as will enable the Post Office Department authorities to recognize the value which has been accredited by the most conservative business organizations throughout the country to the electric vehicle as a transportation utility in city services; and furthermore, the possibilities of its comparative economy when applied to the functions desired in the haulage and delivery of Parcel Post material.

Active committees of these two associations have been formed to render co-operative assistance to the executives of the Post Office Department.

One of the purposes in view is to make known the many and particularly interesting reasons, not yet fully appreciated, as to why the electric vehicle has superior advantages over any other type of vehicle for transportation purposes within the limitations of city and suburban service, as distinguished from either long-distance service or rural delivery. The electric type of machine has been evolved under the most rigorous and exacting service during the past fifteen years and as a successful device in quantity installations for commercial purposes has commanded the endorsement and the investment of the merchant community.

Some Impressive Electric Truck Investments

Many million dollars have been invested in electric commercial vehicles by the most conservative business organizations in the country, including express companies and

investments have been made in any other type of commercial motor vehicle.

Wherever they have been installed within the field of their rational application they have not only remained, but by influence of their economy have forced increase in their



Electric Parcel-Post Delivery at Indianapolis

others to whom reliability of transportation equipment is of vital importance, and, as stated above, no corresponding collective

number. For some years they have been successfully employed in considerable numbers by many government departments such as the Navy Department, Treasury Department, Government Printing Office, the Insular Bureau and by some contractors in the service of the Post Office Department.

An approximation of the value of some of these large investments is as follows:

| | |
|--|----------------|
| Express and transfer companies..... | \$3,010,000.00 |
| Public service companies..... | 3,671,000.00 |
| Department stores..... | 5,627,000.00 |
| Packing-house organizations..... | 609,000.00 |
| Breweries..... | 5,350,000.00 |
| Wholesale merchants and manufacturers..... | 2,088,000.00 |
| United States Government service.... | 435,000.00 |

Electric Parcel-Post Delivery in New York City

For postal service in the United States it seems evident that motor vehicles must necessarily supersede the older horse-vehicle equipment and during the past five or six years a number of motor vehicles have been employed. Conspicuous among these has been the satisfactory performance of 20 to 30 electric machines in service in New York City during the four-year contract period recently closed.

Twelve of these electric trucks are now in service, making deliveries from nineteen



Electric Trucks of the Government Printing Office, Washington

postal sub-stations in New York to addresses of large and heavy packages sent through the parcel post. This service was begun with the inauguration of the parcel post, seven vehicles having been used during the first months, fifteen for a subsequent period, and later, due to changes in the system, this number has been reduced to the twelve mentioned.

not including the wages of the carrier, was \$5.60. The unit costs were as follows:

| | | |
|----------------------------|--------|-------|
| Stops per mile | 6.02 | |
| Cost per stop | 3.26 | cents |
| Cost per parcel | 2.06 | cents |
| Cost per parcel mile | 0.0011 | cents |

From a consideration of the foregoing, it will be realized that the application of motor vehicles to parcel post transportation offers considerable opportunity for expe-

Denver company, however, has arrangements with over sixty drug stores, located in various parts of the city, whereby consumers are enabled to pay their monthly bills in their own vicinity. This condition does not permit these consumers to come to the main office and, consequently, they miss the opportunity of being familiar with the various lines displayed in the show-rooms.

The aggressive commercial spirit of this company saw fit to take the showroom, as it were, to the premises of these and other consumers. The city is divided into fourteen territories, each being managed by a company representative. These fourteen representatives and their associates decided that the best idea to use in assisting them to get their wares in the visions of their prospects was to purchase a commercial car and have it assigned to each territory at regular intervals, upon which day the representative personally conducted the route of the truck in reaching his prospects.

The truck purchased was a two-ton Baker electric, with a large platform body, as shown in the illustration. This car carries a number of the different types of ranges, gas water heaters and electrical appliances, arranged so as to allow an aisle, facilitating close inspection. The customers are invited from their houses to inspect the appliances on the truck, a portable staircase being attached to the rear of the vehicle.

This commercial car furnishes a service for this company that no other equipment would provide. In the first place, its circulation on the city streets attracts attention to the electric car. In addition, the factor of safety is very evident. Had horses been employed, and the attendants on the truck were engaged in the rear of the vehicle or on the steps with their prospects, and had, for any reason, the horses started, some injury might have resulted to a customer. The truck also permits of a higher rate of speed than horses, and lastly it demonstrates the versatility of the electric truck and proves that it is by no means restricted to transportation uses. This proved a paying proposition, and the truck paid for itself the first season.



Electric Trucks at the United States Navy Yard, Boston

During the month of December, 1913, in 27 days these machines travelled 7,111 miles and delivered 98,243 parcels. At this rate the parcel-post truck fleet covered an average distance of 263 miles per day or 22 miles per individual vehicle. These vehicles it should be noted have, however, capacities of 45 miles per charge. Deliveries were made at the rate of 3628 parcels per day, or about 303 per day per vehicle. The average distance traveled per package delivered was 0.0724 miles, or 382 feet. At the rental paid by the Government for this delivery service the average cost per parcel was 3.3 cents, not including, however, the salary of the carrier who accompanied the truck on its round and made the actual deliveries.

In addition to the electric trucks just mentioned a number of large machines are used for mail haulage between the New York City depots and postal stations. Some of these cars have been in service five or six years, having been used 24 hours per day and every day in the year during much of this period. Such mail service according to those familiar with its requirements is one of the most exacting to which motor trucks can be applied.

Parcel-Post Delivery Data From Indianapolis

The three electric delivery wagons used by the Indianapolis Post Office have proven very reliable and it is declared have never failed to perform any service that they have been called upon to do. In point of speed and mileage they have been found ample for parcel delivery, for the requirements in this direction are well within the range of their capacity. In a seven-hour working day these electric wagons averaged 271.5 parcels in 189 stops over a distance of 18.75 miles. The cost of the day's run.

diency and economy in the conduct of any program which the Postoffice Department may determine upon. In the solution of the questions involved, the proposed collaboration by the Electric Vehicle Association of America and the National Electric Light Association should be of material assistance to the Department.

USING AN ELECTRIC AS A TRAVELING SHOWROOM

A decided innovation in gas stove sales methods has been made by the Denver Gas & Electric Light Company, Denver, Colo. The usual custom with gas companies is to have a display and salesroom where the people have to come to pay their bills. The



A Truck for Demonstrating Gas Stoves

A two-ton Baker Electric used by the Denver Gas and Electric Light Company for a traveling showroom

ELECTRICS IN DETROIT

By LEN G. SHAW

An unusual condition, and one which furnishes a striking commentary on the efficiency of motor trucks, exists in Detroit, Mich. All the national express companies have offices there, and all are keen after business. The Adams Express Company is among the number, ranking a close second if, indeed, it does not take first place in the volume of traffic handled. Herein lies the curious feature of the situation—the Adams Express Company has no steam road connections out of Detroit. Its business is handled over the interurban lines which reach out in every direction, eventually of course putting it in touch with steam lines.

In spite of what would at first thought seem an insuperable barrier, the Adams Express Company not only handles an immense amount of traffic, but handles it in an eminently satisfactory manner. To do this a fleet of twenty-five electric trucks are employed, making pick-ups and delivering goods consigned to Detroit concerns. This is several times the number of motor trucks employed by its nearest competitor and to this fact is attributed much of the success achieved. The company is able to cover the city thoroughly, and get express matter started promptly, as well as to make deliveries in a hurry. And in the express business time is money.

The trucks are all General Motor Company electrics. There are seventeen one-ton, five one and one-half ton, and three three-ton. Twenty-three of these went into commission November 15, 1912, the others having been added since that time. They average 30 miles apiece daily. The company maintains its own garage at 143 Howard Street, where the cars are cared for in every detail. All expense in connection with their operation is carefully tabulated, and it is possible to tell at a glance just what each truck is accomplishing.

During the winter months, when conditions are particularly unfavorable, the cost of operating these trucks averages \$4.25 per day apiece. In good weather the average is around \$3.50. This includes all overhead expense, driver's wages, recharging, replacements, tires, and repainting and overhauling once each year, this being an

established rule of the company. The cars are in commission every day.

So closely allied to the express business in the nature of their work are the two one-ton trucks employed by Farrand, Williams & Clark, wholesale druggists in Detroit, that the showing made is of interest at this time. The trucks are G-M-C, equipped with two A6 Edison 60-cell batteries each. From March 1, 1913, to February 28, 1914, the total expense of operating these two trucks was \$1,115.50. This included garage expenses, the cars being kept at a public place—washing every night, electricity, and minor adjustments. In this is incorporated \$94 for changing the solution on batteries, a bill of \$150 for repairs being covered by the garage guarantee. The trucks were in operation 275 days, the total mileage for each car being approximately 15,000. The total number of stops with packages was 34,312, an average of considerably more than two to a mile.

THE E. V. A. TO DISCUSS FREIGHT-TERMINAL CONGESTION

On April 24th, Fred A. Hortter, Car Accountant, Boston & Maine Railroad System, will present a paper entitled "The Effect of Power Wagon Operation on Terminal Freight Congestion," before the Electric Vehicle Association at its headquarters in the United Engineering Societies Building, 29 West 39th Street, New York City.

Mr. Hortter's paper is based on extended investigations conducted over a period of more than five years in both railroad and steamship fields.

A large attendance is expected; and a number of prominent operating railroad and steamship officials will take part in the discussion.

WASHINGTON SECTION OF ELECTRIC VEHICLE ASSOCIATION OF AMERICA FORMED

On Thursday evening, March 12th, the organization meeting of the Washington Section of the Electric Vehicle Association was held in the offices of the Potomac Electric Power Company of that city. The Washington Section is the fourth branch of the Association, which has over six hundred members. Other Sections, aside from

the activities in New York—headquarters of the Association, have been organized in Boston, Chicago and Philadelphia with the likelihood of other Sections being established at an early date.

President Smith addressed the new Section.

The officers of the Washington Section are: E. S. Marlow, Chairman; R. B. Emerson, Vice-Chairman, and C. M. Marsh, Secretary and Treasurer with offices at the Potomac Power Company, 231 14th Street, N. W., Washington, D. C.

PERFORMANCE CHARACTERISTICS OF ELECTRIC MOTORS

The monthly meeting of the Electric Vehicle Association of America was held at the Engineering building, New York City on March 24th. A paper entitled, "The Performance Characteristics of Electric Motors and Their Influence on the Operation of Electric Trucks," was presented by T. H. Schoepf, of the Westinghouse Electric and Manufacturing Company, Pittsburgh, Pa. In addition a report of the activities of the association during the past month was read by the secretary.

It was generally agreed that the use of the two types of motors, one for hilly work and the other for level country, in the same truck models was not desirable, first, because it was undesirable to carry two types of motors in stock, this lack of standardization increasing the manufacturing cost. Secondly, because it was impossible to make the two motors fit into the same space in the chassis. Thirdly, sometimes a truck is used for a period of time in one section of the country and then sold and used in some other section, where the character of the road is entirely different. Therefore a truck designed for level country and equipped with a high speed saturated motor would not give the best satisfaction if transferred to a hilly section, where an unsaturated motor should be used.

Fuller Electric Company, Detroit, has designed a large electric bus along the lines of a double-decker street car. This is to take the place of the regular electric street cars running on rails.



Fleet of G. M. C. Electrics Operated by the Adams Express Company, in Detroit

WESTON-MOTT HISTORY



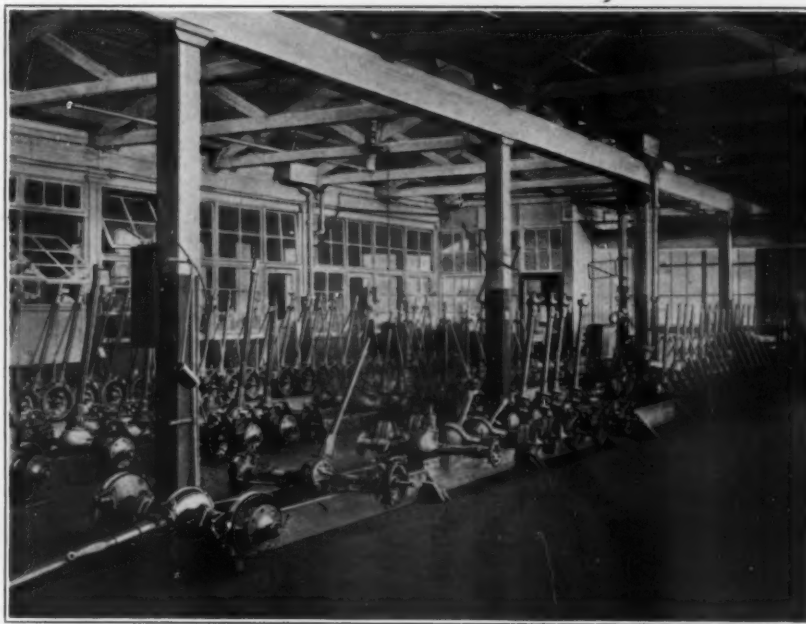
THE history of the Weston-Mott Company dates back to the year 1884, during the early days of the safety bicycle. At that time the industry consisted of the manufacture of bicycle hubs, rims and wire spokes. The decline of the bicycle business made it necessary to branch out into another line and wire wheels and naked axles for buggies and runabouts were brought out. The output was further increased by the manufacture of jinricksha wheels for Asia and Africa, invalid chairs, sulky, light agricultural implement and push cart wheels, in fact the development of all kinds of high grade wire wheels.

In 1898 the factory at Utica, N. Y., was built and the company was right in line to furnish wire wheels for automobiles which came very soon thereafter in quantities very large for those days and the factory capacity had to be increased. Then almost without warning the bottom fell out of the wire wheel industry and it was necessary to switch to the making of hubs and rims for artillery wheels as now used on motor cars, and as the automobile makers insisted upon purchasing their hubs where they bought their axles, it was quickly recognized that the company must make axles.

In 1905 the company was approached regarding the establishment of a branch factory in Michigan, and as the limit of the Utica plant had been reached, it was decided to leave it altogether and build a new factory in Flint of very latest construction where all requirements of manufacturing at lowest possible cost could be met. In 1907 the factory of 60,000 ft. of floor space was opened and before long this was found to be entirely too small to take care of the increasing business. Since the two additions have been made to the original No. 1 plant which are called Nos. 1, 2 and 3

plants, with a total of 180,000 sq. ft. of floor space and at which plant are manufactured only rear axles. No. 4 plant has since been completed and consists of three floors with 90,000 sq. ft. of floor space. In this plant are manufactured only hubs and rims. No. 5 plant was then built and

In 1909, 25,000 sets of axles, hubs and rims were built and this year more than 75,000 sets will be shipped. The pay roll of the company is nearly \$2,000,000 per year. The line of manufacture now is confined to automobile axles, hubs and rims. In axles the I-beam predominates, but the



Final Inspection of Rear Axles in the Weston-Mott Plant

is used exclusively for the manufacture of front axles. The Weston-Mott modern heat-treating plant was recently built and is the most up-to-date building of its kind in the country. It is built entirely of steel and concrete and has 20,000 ft. of space, making a total of 380,000 sq. ft.

manufacture of the tubular type is continued on a small scale. The rear axles are of bevel and chain type and both ball and roller bearings are used. In the evolution of the business, trade requirements have grown very strict as to quality, design and noise and the company has developed a large engineering department with fully equipped chemical and physical laboratories, master mechanics, experimental, cost and accounting departments to meet all conditions, with the result that the Weston-Mott Company stands in the foremost ranks of its line and is the largest producer of automobile axles, hubs and rims in the world.

The officers of the company are: C. S. Mott, president; H. H. Bassett, general manager; H. J. Mallery, comptroller; D. K. Moore, sales manager; F. A. Bower, chief engineer; W. N. Edson, purchasing agent.



Part of the Weston-Mott Front-Axle Plant

SCHOOL FOR DRIVERS OF MOTOR TRUCKS

By S. V. NORTON

Manager Goodrich Truck Tire Sales

It has been most interesting to me to learn the various ways in which truck manufacturers and their representatives are improving the service given to owners of their trucks. For instance, realizing the importance of well trained, experienced drivers, one company in Boston has established a drivers' school, in which young men are given a thorough training in the care and operation of their trucks. These

men are guaranteed positions after they satisfactorily complete the course of instruction required in this school, which consists of learning the details of construction, as well as everything in connection with the operation of this particular make of truck.

SOME TRUCK DON'TS

Don't use a five-ton truck for pleasure work, nor a 1500-lb. truck to meet the requirements of a three-ton truck. Delivery at minimum cost is governed primarily by the construction of the truck and its purchaser to continue this policy would

is great, such as when lumber is hauled, the proportion of the load carried on the rear axle is increased. Allow for this in tire equipment. It is well to remember that in all cases the truck should be loaded as far forward as possible.

Don't buy truck tires until you study your road conditions—differentiate between country and city driving, between street conditions in different cities, between gas and electric driven vehicles and between equipment suitable for rear wheels as against the front.

Don't neglect to keep the clutch in good working order, and thus avoid quick starting strains on the rear tires.

Don't apply brakes suddenly—also keep brakes in uniform adjustment so that both wheels will share equally in breaking the motion of the truck. Considerable damage from skidding the tires and straining the fastening device and the rims is thus avoided.

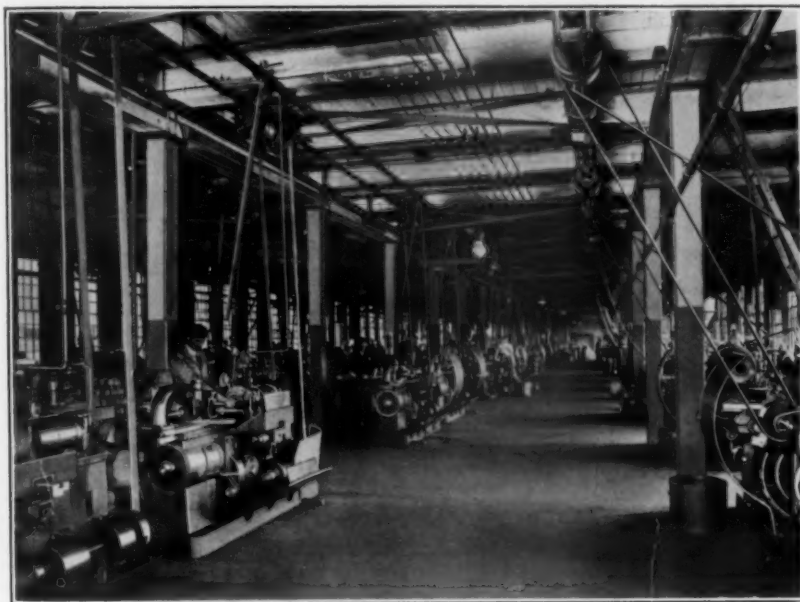
Don't pass a week without going over all the nuts and bolts on your truck, including rims, to see that they are tight.

Don't fail to give the wheels frequent attention. Worn bearings and other irregularities permit wheels to wobble. Also take measurements for alignment. Do these things and avoid the quick wearing down of the tires.

Don't overlook the steering wheel. Be on watch for bent steering knuckles, connecting rods or too much play in steering wheel.

Don't drive in car tracks or you will weaken and break down your tires. Don't use any other but a removable rim which will permit the frequent interchange and reversing of tires so that all four tires will wear down evenly.

Don't forget that rubber has a limit to its strength and when taxed beyond that point damage to both tires and truck is to be expected.



Part of Hub Department of the Weston-Mott Plant

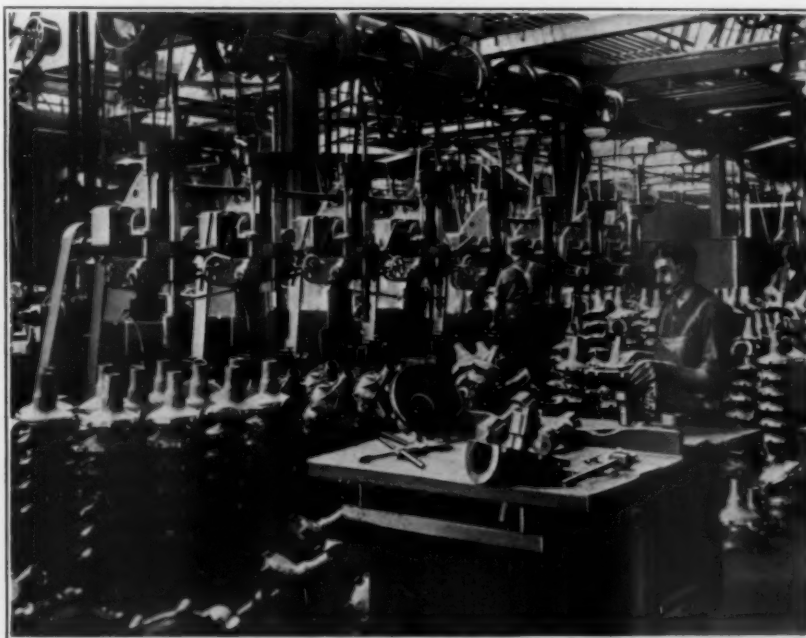
As this school is conducted in a very practical manner, the drivers have unusual opportunities for learning how to care for trucks. The agent who conducts this school makes a strong point of his ability to keep in continuous service the trucks operated in his territory. Suppose, for instance, that a truck belonging to one of his customers has met with some accident, such as may happen to any machine on the road. The driver of the truck sends a call for help to this agency. A similar truck is immediately dispatched to the scene of the accident in charge of an experienced driver accompanied by several of the young men of the drivers' school.

This affords the students an opportunity to learn what has caused the accident and how to remedy the trouble. The disabled truck is either repaired or its merchandise is transferred to the service truck with a minimum of delay, and the goods are immediately sent on their way. The student drivers have learned how to cope with a new situation, while the owner of the truck in distress has received valuable assistance, which has enabled him to continue the service for which his truck was purchased.

This drivers' school is of much benefit to the truck sales agent because when he sells a truck he is at once in position to furnish a competent driver, thus overcoming one of the most serious obstacles to the introduction of motor driven delivery service.

A tractor is being used to haul a string of trailers from Los Angeles to the coast, a distance of 20 miles. William A. Rider, the inventor, is at work trying the tractor as an agricultural device, with plows, cultivators, etc., attached.

mean sacrifice of durability of both truck and tires. You should not load your truck according to the bulk—you should know when the truck's rated capacity is reached. Make two trips if necessary rather than pile it all on one load. The type of merchandise and the design of the body should also be considered. Where the overhang



Inspecting Rear Axle Housings in the Weston-Mott Plant

How the Baltimore Bargain House Doubled the Efficiency of Its \$60,000 Commercial Car Installation

(Continued from page 11)

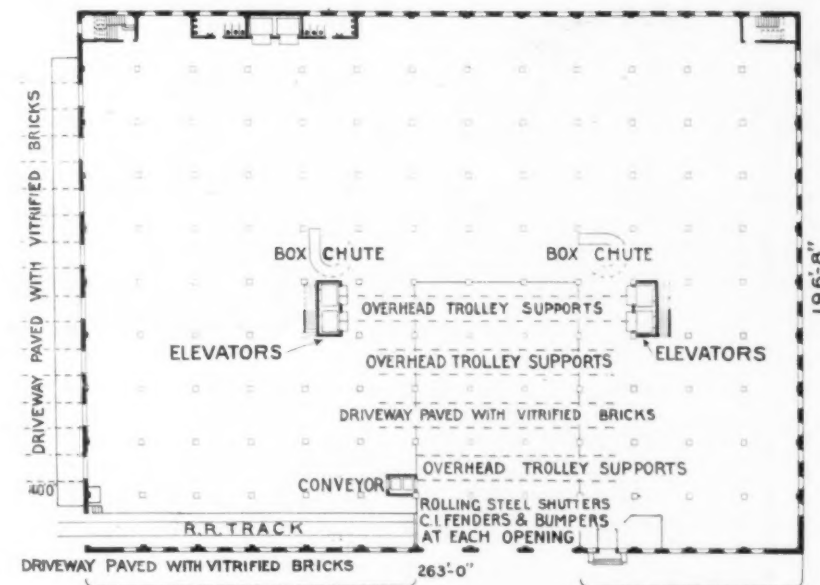
The driver operates one of the chain blocks less than 2 minutes for removing the body, and 2 minutes for putting a loaded one in place, instead of spending from an hour to an hour and a quarter hustling cases and barrels.

This whole operation, as seen by the writer, occupied about 5 minutes, and could even be done in less time if there was any reason to make a record. The chains are then unhooked, the driver jumps into his truck, and is off again in from 5 to 6 minutes from the time he entered the building, and this is not a show performance, but is going on steadily all day, every day and by the entire fleet of seventeen trucks.

This installation includes eleven five-ton G. V.'s, two three and one-half-ton G. V.'s, one two-ton G. V., all made by the General Vehicle Company, Long Island City, N. Y., and one five-ton C. T. truck of the Commercial Truck Company of America, Philadelphia, and one two-ton Pierce-Arrow, worm-driven gasoline truck, and one three-ton Packard truck. This is the present fleet.

All Horses Are to be Sold

Since the introduction of this system the efficiency of the trucks has been doubled, making this \$60,000 investment equivalent to a \$120,000 equipment. The work is being done so rapidly, and so economically by motor-driven vehicles that horses cannot be considered, and the eight remaining teams are to be sold, making it an all motor in-



The First-Floor Plan of Storage Warehouse, With Overhead Trolleys

This enormous warehouse, containing over 440,000 square feet, is entered by railroad, also by motor-driven trucks. The triplex block overhead trolleys and removable truck body system is used, as well as every kind of mechanical device to assist the handling of merchandise.

stallation. Orders are already in for five more vehicles, which are to be delivered by the 1st of July, and the probabilities are that ten more will be put in service by the 1st of the year.

Virtually Increased Loading Space One Hundred Per Cent

This system became effective only December last, but there could be immediately seen a saving in the cost of operation, but this will be very much more effectively

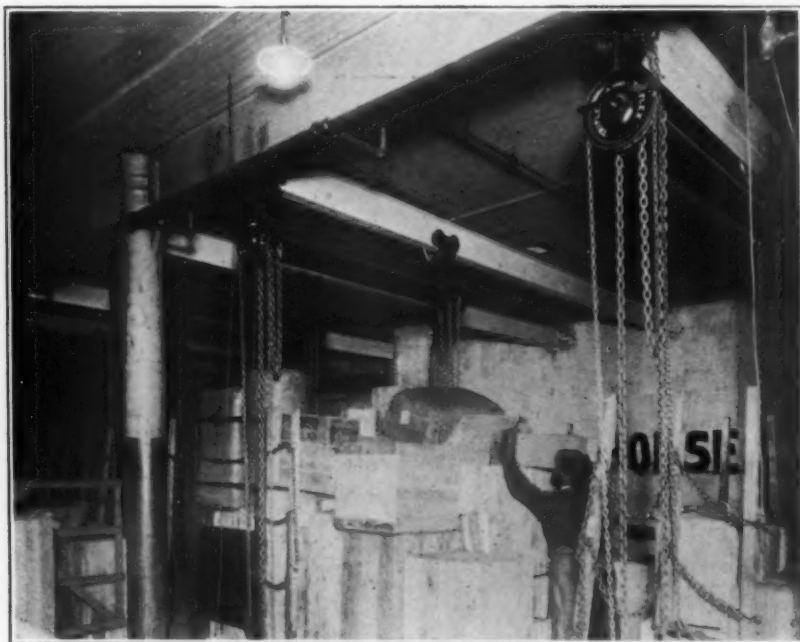
shown at the end of this year. The loading formerly took in the neighborhood of an hour, which meant that each of these valuable units had to be standing idle that length of time. The saving of one hour a day per trip means an average saving of four hours a day per truck, which figured on a basis of 2 cents per 100 lbs carried, makes a total saving of \$2400 per year per truck, on a basis of three hundred working days a year. As floor space at the present loading platforms was at a premium, a saving is also credited to this system as it has increased the loading capacity fully one hundred per cent.

Contrary to what might be expected, these removable platform bodies are not expensive. They consist simply of a steel framework, using cross pieces of structural I-section, with steel bands around the outside, and planked over on the top and with sockets for stakes. The stakes are made by the company themselves with the ends steel sheathed to protect them. These bodies complete, made in this way, do not cost over \$80.

Truck Bodies Larger But Save Space

They are each 17½ ft. in length by 7 ft. wide; in other words, the removable truck body as it stands against the platform increases the actual platform space by 122½ sq. ft., and as there are eighteen of these bodies now in use 3205 sq. ft. of additional space is available.

At this point the comparison of the space occupied by horse wagons as compared to the trucks, may be interesting. A 12-ft. wagon which has a body practically only 4 ft. wide, with the horses takes up from 24 to 25 ft. in length. Only six of these representing a wagon platform area of but 288 sq. ft. can be loaded at once. Contrast this with the truck bodies, which are 17 ft. 6 in. long, by 7 ft. wide, eight of which can be loaded at once, or 1102½ sq. ft., which shows an increased carrying space



Loading the Body

While the trucks are delivering, the removable bodies are being loaded as shown. This is a view from the platform toward the arca-way. The man shown is on one of the suspended bodies, loading same. Hand trucks are wheeled right from the platform onto the body to be loaded.

Firestone

Truck Equipment

Solves the Problem of the "Extra Tire"—the "Emergency Replacement"

Firestone Quick Removable Rims are the key to the situation. Simply because they really *are* easy to remove and replace. Any driver can make a replacement in a few minutes—or, in the case of a heavy truck, any driver and his helper.

Our local service station will change over the wheel equipment of your trucks promptly. Then you will be *insured* against costly and annoying delivery hold-ups.

The Firestone service stations are in all large cities, and they are the most efficient in the business. All Firestone equipment is built to S. A. E. standard. So, regardless of your present equipment, we can serve you best, whatever your tire requirements may be.

No equipment, however, can give you *full efficiency*, no matter what service you get, except the simple Firestone Quick Removable Equipment.

Let a Firestone man call and talk it over. Let him show you the various types of Firestone tires and give you the benefit of his knowledge and experience, in selecting the style best suited to your needs. It is in this way that you will eliminate your truck equipment difficulties and insure yourself—

Most Miles per Dollar

Call Your Local Firestone Branch or Write Us.
Catalog on Request.

The Firestone Tire & Rubber Co.

Akron, Ohio

All Large Cities

"America's Largest Exclusive Tire and Rim Makers"

Pneumatic Tires, Truck Tires, Pleasure Electric Tires, Carriage Tires, Fire Apparatus Tires, Rims, Tire Accessories, etc.



When Writing, Please Say—"Saw Your Ad. in the C C J"

over the horse wagons which could be taken care of at one time, of 814½ sq. ft.

Trucks Keep Platform Cleared

As this installation was viewed by the writer this month, which is the busy season for the Baltimore Bargain House, a splendid opportunity was had to see how effectively the trucks keep the goods moving. The loading platform was kept fairly free of goods, a complete line of suspended truck bodies with their full loads hung ready for the trucks the instant they come into the building.

his own unloading system, so that the trucks will not have to be held up. The longest haul is to the Pennsylvania Railroad station which is only a mile, all of which makes this paying installation of motor-driven vehicles of greater interest, as it is essentially a short haul proposition.

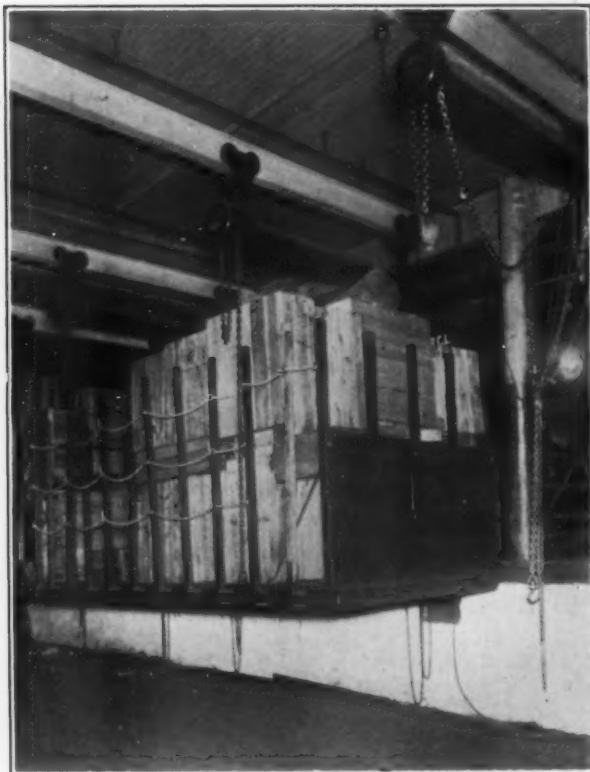
The System Applied to New Warehouse

The company is now building what is said to be the largest storage warehouse of its kind in the State. This building will have 440,000 sq. ft. of floor space, and is

Close to the elevators will be noticed two spiral box-chutes. These are far from ordinary, as they are each 20 ft. in diameter, and can accommodate an enormous quantity of goods. At the left of the driveway will also be noticed a conveyor.

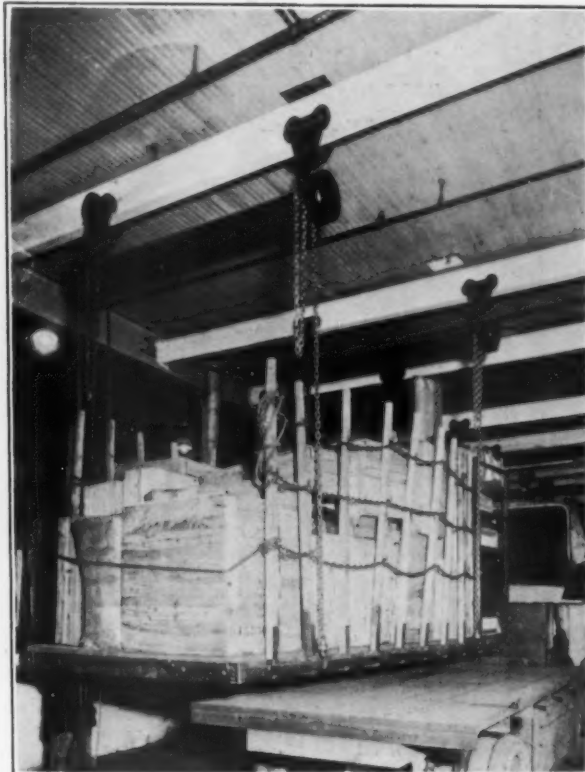
Railway cars will also enter the building, and mechanical conveyors will move their contents to the various floors of the building.

It will also be noticed from the plans that the entire left side of the building is one continuous loading platform, approximately 165 ft. in length backed by a series of 8-



Loaded Bodies Waiting for Trucks

Each body has a full five-ton load ready to be trolleyed over and lowered into place on the truck. Stops at the front prevent the body from shifting forward and scratching the rear of the cab.



Loaded Body Almost Ready to be Lowered Into Place

Attention is called to the clip at the rear of the truck, which prevents the body from shifting. There are no bolts or fastenings of any kind necessary to hold the bodies in position.

Mr. Neilson said that previous to the installing of this system it was a common sight to see the platform piled high with goods, which congested the place to such an extent that much valuable time was lost in finding and arranging the various pieces of merchandise. Of course spiral chutes and mechanical conveyors are employed to bring the goods to the loading platform and no time whatever is lost in useless manual labor.

All Are Short Hauls

This house is wholesale only, so that the hauls are to freight yards, railroad stations, boat landings, and stores. The shortest haul is to the B. & O. freight yards, this being a half mile, yet in spite of occasional hold-ups at the yard, the great saving of time at the loading point has made it pay to send the motor-driven vehicles, even to these congested places, and Mr. Neilson hopes at certain yards to be able in the near future to make arrangements to install

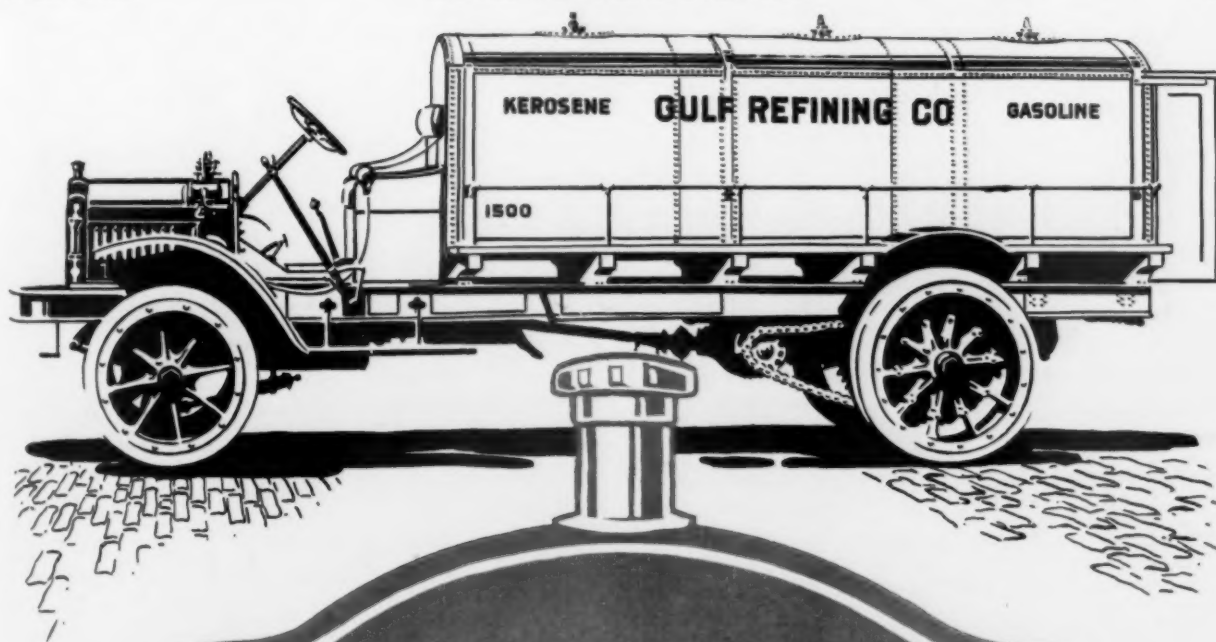
built entirely of reinforced concrete and steel. Every known mechanical device to reduce to the minimum the cost of handling merchandise is to be installed. The layout and method of employing the overhead and removable body system can be readily had by looking at the accompanying first floor plan. It will be seen that there is an areaway directly into the building from the front, extending for 100 ft., and having a width of 60 ft., with a loading platform on each side and also at the end. In dotted lines are shown the overhead trolley lines. The end trolley extends to a point in front of the elevators, there being two on each side of the platform. By this arrangement trucks can drive directly into the building, have the loaded bodies trolleyed and deposited in front of whichever set of elevators will be handiest to the place the goods are to occupy on the floors above. This method does away entirely with hand trucking from the edge of the platform to the elevators and will save much time.

ft. doors into the building, and served by the same overhead trolley removable body system. In front of this is a driveway 40 ft. in width, paved with vitrified brick.

Ground is just being broken for this building at the time of this writing and when it is completed the Baltimore Bargain House will probably have one of the most complete and efficient installations of motor-driven vehicles in the country. The progressiveness of this firm is very commendable, and its example can doubtless be followed to advantage by many other fleet users who have not as yet perfected their delivery system.

Classified Advertisement

A MOTOR TRUCK DESIGNER OF acknowledged ability and experience for factory now fully occupied; want an aggressive man with wide range of knowledge of the motor-truck industry. DESIGNER, care of this JOURNAL.



Why Experiment When Others Have Experimented For You?

TO get the best motor transportation service, you *must* employ White Trucks. There is no question of their economy of operation, durability of construction and dependability. Thousands in daily service in practically every line of business guarantees that *your* investment in White Trucks will be no experiment. There is a White Truck somewhere answering your own particular hauling problem.

Let The Owner tell you the Story

THE WHITE  COMPANY
CLEVELAND

*Both in quantity and value of production, the largest manufacturers
of commercial motor vehicles in America.*

MOTOR 'BUSES FOR HIGHEST ROAD IN WORLD

The highest road in the world, reaching an altitude of 17,000 ft. as it crosses the Andes Mountains near Potosi, Bolivia, will be the route of a motor bus line to be established by the Bolivia Automobile Company, of Sucre and Potosi. Four specially-built White buses, having six-cylinder, 60-h.p. motors, were shipped from Cleveland to Potosi to replace the mule-drawn coaches which have been the only form of transportation between the two cities.

A former Californian, now a partner in the company, who visited this country for the purpose of buying the equipment, describes the Potosi-Sucre route as one of wonderful scenery and great danger. For a distance of 10 miles, he said, the road skirts the edge of a precipice, having a sheer drop of 3000 ft., and it is so steep in some places that the passengers of the stage coaches invariably prefer to get out and walk. For this reason he was particularly careful to purchase cars of unusual power, extreme simplicity of control and powerful brakes. Some years ago a coach containing ten passengers and drawn by six mules went over the precipice and all were killed. The Bolivian government thereupon built a stone guard wall along the edge. As a further safeguard to traffic, the government has made a ten-year contract with the Compania de Automoviles to improve the roads over which the new motor buses will carry passengers and mail.

The buses will always be operated at an altitude of 7000 ft. or higher. The city of Potosi, the terminus of the railroad line leading up from the Pacific coast, has an altitude of 14,000 ft. Leaving this city the buses will begin a climb of five kilometers (a little over three miles) and cross the highest pass of the Andes at 17,000 ft. elevation. The average grade from Potosi to the pass is 17 per cent., and there are dozens of sharp turns. From the summit there is a gradual descent for over 100 miles until the City of Sucre, capital of Bolivia, is reached. On this portion of the route it is necessary to cross several riverbeds which are drying during a dry season of eight months. During the remaining four months of the year, the service is annulled. The return trip consists of a steady pull for over 100 miles. Mule-drawn stages make the trip one way in thirty hours, whereas the motor buses will be operated on a

twelve-hour schedule, making a daily trip in each direction.

Entirely aside from the revenue derived by the operating company for carrying mail, the concern gets a big income from passenger traffic. Baggage is carried at an extra cost. The truck equipment, though identical from a mechanical standpoint, consists of two classes. Three of the cars have bodies of the express truck type, with roof, drop curtains and four adjustable seats to carry eleven passengers. The fourth is a "Deluxe Extra Fare Car" with three heavily upholstered seats like those of a touring car and standard automobile tops. The car is intended to carry seven passengers.

All four buses are built with the White electrical system of starting and lighting. In addition to the usual equipment of lamps, each bus is fitted with an electric swiveling head lamp mounted on the dash. The tire equipment consists of pneumatics with non-skid treads.

In order that the buses may be operated and maintained in the most efficient manner, Mr. Wilson has engaged factory-trained men to go to Bolivia. When the Sucre-Potosi line has been established, his company will start two other lines, one operating from Cochabamba to Tarata, Totora and Nisque, and the other between La Quiaca and Tarija.



Truck Handling Large Sums

Where large sums of money have to be moved quickly to insure their remaining intact, trucks have come to the fore. An instance of this occurred lately in St. Louis, when Boatman's Bank Building was destroyed by fire. When it had cooled, the gold and securities were removed from the vault and taken away by a Garford, on Firestones, \$1,373,000 in cash being taken on the first trip, and \$1,400,000 the second trip.

TEXAS MOTORWAY TAKES THE PLACE OF THE RAILROAD

That the commercial car has made possible the solution of the transportation question for vast areas of country without railroads, permitting a more complete development of agricultural lands and other natural resources, is exemplified in the work now going on in the State of Texas, in the district lying southwest of Dallas and Fort Worth.

Lying to the southwest of these two large cities of north Texas, is a large area of country without direct rail communication, and through which the Texas Motorway Corporation is now constructing the only private corporation owned motor highway in the southwest. About a year and a half ago the motorway was proposed by John B. Christensen, President of the company, a company was formed and up to the past month twenty-five miles of the motorway have been completed, and five miles of smooth, hard surface road is being added to its length every month.

The motorway is being constructed through a rich and prosperous territory which at the present time has natural market centers, Dallas and Fort Worth. As the road is corporation owned, a toll is charged to parties desiring to use it and motor cars only are permitted. The road is designed primarily to provide a freight and passenger service to the citizens of this great area now forced to travel a tedious and round-about way to reach market and social centers.

The road is being constructed across country on its own right of way, is 100 ft. wide, is drained and surfaced, while at public crossings, stock guards are constructed and a track laid for automobile wheels. When completed as planned the road will be 100 miles long; although later it may be extended to the Mexican border. Trucks from one to ten-ton capacity are being put into service.

The City of McKeesport, Pa., with a population of 61,000, will motorize its police and fire departments. This was determined last week by the city council and bids are being advertised for fire trucks and motor patrol wagons. The decisions of the McKeesport council came after a committee from that body visited Pittsburg and witnessed a number of demonstrations of fire apparatus installed in this city during the last three years.



White Motor 'Buses for Bolivia Route

They are to cross the Andes at an elevation of seventeen thousand feet

TRADE MARK
Raybestos
REG. U.S. PAT. OFF.

ONE YEAR **GUARANTEE**

EVERY DEALER should insist upon the cars he sells being equipped with brakes lined with Raybestos, and every dealer should handle Raybestos and do his relining with Raybestos, because it is a brake lining he can stand behind, as its makers stand behind the service of every Raybestos-lined brake.

If Raybestos fails to give actual wear of one full year from the date it is placed on the brakes, we will furnish new lining without charge. This Guarantee applies to all types and weights of pleasure cars and to all light trucks.

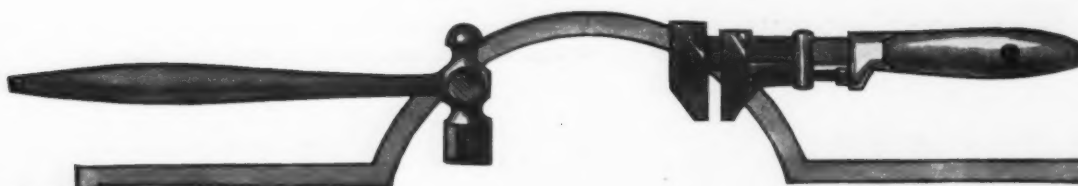
The name on every foot and the silver edges identify Raybestos—the only brake lining with a definite guarantee.

**CARRIED IN STOCK BY LEADING JOBBERS
AND DEALERS EVERYWHERE**

The Royal Equipment Company

1382 Bostwick Avenue, Bridgeport, Conn.

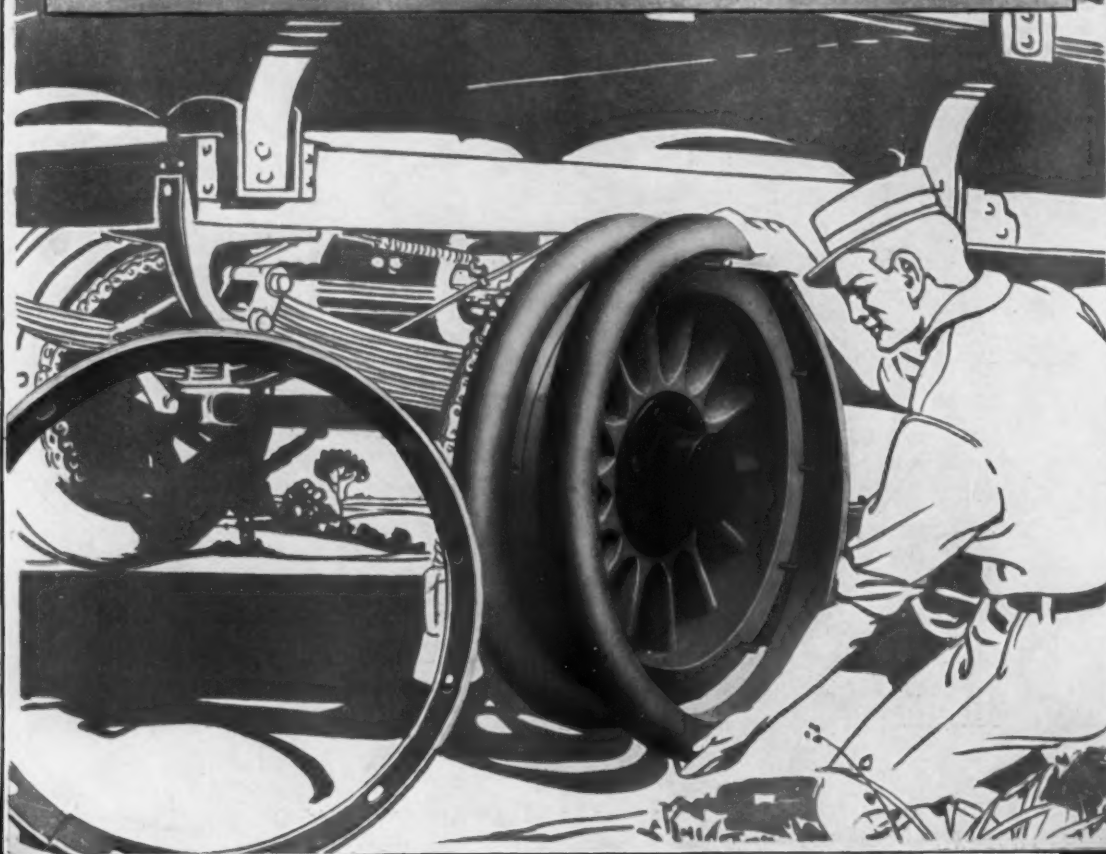




Motor Trucks Cut Hauling Costs

But to show the maximum saving they must be equipped with UNITED STATES MOTOR TRUCK TIRES. There are two reasons for this:

- 1st—UNITED STATES MOTOR TRUCK TIRES are long service tires.
- 2d—Their use lowers repair bills. When changes are necessary, your own men can make them, either in your garage or on the road.



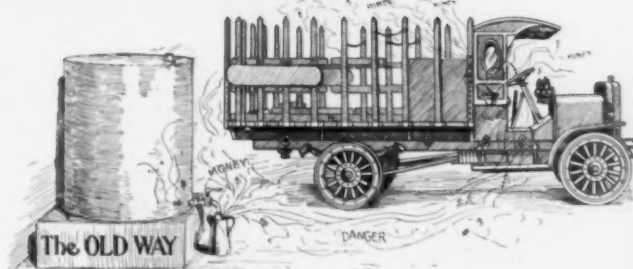
United States Motor Truck Tires

SERVICE STATIONS IN ALL PRINCIPAL CITIES

When Writing, Please Say—"Saw Your Ad. in the C C J"

Wherever You Smell Gasolene You Need a Bowser

Stop the Leaks!



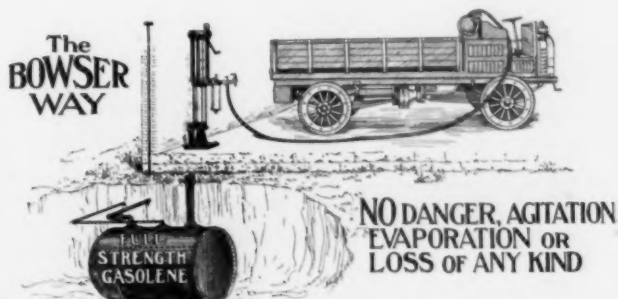
Why continue to pay for gasolene you never get to use? Turn **all** your gasolene into mileage.

Just so long as you continue to store gasolene in tin receptacles, keep it in any old place above ground, you will lose at least 20% of the power-producing vapor, which will never reach your engine. How many miles would this loss drive your truck?

High-priced efficiency experts are combining over the intricacies of many a business to find and stop leaks of 1% or less, and yet, many car owners are suffering a great loss in gasolene, without protest.

Stop the leaks in your garage! And don't blame the chauffeur. He's just as anxious to make a showing as you are to reduce up-keep. A **BOWSER SYSTEM** will do both. It will save you money

every day, by preventing evaporation and loss of every kind. It's safe, too, removing all danger of fire and explosion. It will assist your employees to take more pride in their work.



Safety, economy and convenience dictate the installation of a **BOWSER SYSTEM**. There's one suitable for every condition—**price, size and style** to exactly meet your needs. Send for our free book—it tells all about them, and will not obligate you in the least.



S. F. BOWSER & CO., Inc.

HOME PLANT AND GENERAL OFFICES

Box 2118 FORT WAYNE, IND., U. S. A.

Sales Offices in all Centers and Representatives Everywhere

Original patentees and manufacturers of standard self-measuring hand and power-driven pumps, large and small tanks, gasolene and oil-storage and distributing systems, self-registering pipe-line measures, oil-filtering and circulating systems, dry-cleaners' systems, etc.

ESTABLISHED 1885



FEDERAL

Why the Federal in Your Line?

The proven adaptability and efficiency of the Federal in more than 120 different lines, and for more than three years, are, in themselves, sufficient reasons.

The wide distribution of the Federal, from coast to coast, in Alaska, Cuba, Porto Rico, the Philippines, the South American Republics, Australia, Portugal and India, confirms the correctness and soundness of Federal design and construction.

The fact that the largest users of motor trucks in the world operate fleets of Federals.

The fact that when another year rolls 'round, the owner of a Federal will have a truck that will still be backed by one of the most responsible organizations in the industry—a truck that will not have deteriorated in value or desirability, either because the maker has gone to the industrial graveyard, or because the truck itself has been forced to the bargain counter.

Consider these facts carefully, for the *right* motor truck will be of wonderful help in your business; but be sure it is the right truck.

Illustrated literature will be sent upon request.

| | | |
|---|---------------------------------|--|
| PRICE Includes Seat, Lamps, Tools, etc. | \$1800 F.O.B. DETROIT | Body Extra Built to meet individual requirements |
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Federal Motor Truck Company
Detroit, Michigan.

ONE OF OVER 60 G.V. ELECTRICS
IN THE SERVICE OF UNCLE SAM.

GENERAL VEHICLE COMPANY, INC.
LONG ISLAND CITY, NEW YORK
NEW YORK—CHICAGO—BOSTON—PHILADELPHIA



When Writing, Please Say—"Saw Your Ad. in the C C J"

Flint

A Wonderful Performance



Capacity 1600-2000 Pounds. Chassis Price—Solid Tires, \$1285; Pneumatic, \$1370

FLINT TRUCK'S PERFORMANCE ON BIG HILLS

Carries Load of 1,675 Pounds Up
Berkeley Hill Eleven Blocks,
Without Stop.

IS A FINE "GRADE EATER"

Radiator at End of Test, Not
Boiling, and Not Too
Warm to Touch.

An interesting test of the
performance of the Flint
was just made under the
direction of W. J. Slater, sales manager
of the Motor Wagon Department
of the Durant-Dort Carriage
Company, makers of the Flint.

Flint Ability Proved in Severe Test

This illustration, telegram and reproduced headlines from the *San Francisco Examiner*, of March 8th, can give but a faint conception of the remarkable achievement of a loaded Flint Delivery Wagon last month, on the steep hills of Berkeley.

What was conceded to be the most remarkable demonstration of Commercial Car hill climbing ever seen on the Coast was, however, only what all Flint Wagons are capable of doing and are doing all over the country.

The value of the performance can be best understood by a brief statement of the more important facts,—

The Commercial Car was loaded to capacity, carrying 1675 pounds.

It easily climbed a hill 8-10 of a mile long with grades up to 26%.

With a load of 2155 pounds, it took a 26% grade 400 feet long, from a standing start.

It was stopped half way up, then started again on the grade, and successfully finished the climb without a falter or a stop.

On a 30% grade, with an 800 pound load, the engine was stopped three times on the grade, then started again, making the entire climb without a hitch.

At no time during the tests was the radiator overheated, being cool enough to lay a person's face against it.

These demonstrations are sufficient to convince any open-minded man that Flint Delivery Wagons are capable of meeting every demand which his service can impose on them.

Flint Motor Wagon Dept.,

When Writing, Please Say—"Saw Your Ad. in the C C J"

Flint

on Berkeley's Steep Hills



6 DE KX 139 COLLECT NL 7 24 AM

San Francisco Cal Mar 11 1914

J D Mansfield Durant Dort Cge Co Flint

On Feb'y twenty five made remarkable hill climbing demonstration before committee of San Francisco News paper Men Negotiated last eleven Block of Marin Avenue Berkeley eight tenths of a mile long percentage of grades respectively nineteen, fourteen, thirteen, twelve, twenty two fourteen, twenty, nineteen, twenty six, twenty four, and twenty four with Live Load of sixteen hundred seventy five pounds negotiated entire climb without any Difficulty then returned to foot of twenty six percent grade block four hundred feet long and from standing start with live load of twenty one hundred fifty five pounds climbed half way stopped car then motor from that position started and finished climb, wonderful feature was no heating of motor radiator after each test cool enough to lay face against without any inconvenience demonstration pronounced by witnesses to be most remarkable ever made on coast.

Wm J Slater.

Flint Ability the Result of Flint Quality

This triumphant proving of the worth of the FLINT COMMERCIAL CAR is not an accident or a chance, but the logical result of the quality of materials and method of construction employed in its manufacture. It is designed and built to be a superior Commercial Car—one which gives efficient, dependable, economical service under the severest working conditions.

The significance of this test is not in the mere creation of a record performance, but in indicating what the ultimate purchaser may expect when the Commercial Car has to work under adverse conditions. It proves ability to withstand a severity of usage greater than would be met in the service of any merchant. It shows it is a safe Commercial Car to buy and a dependable one to own. Write us for detailed description of the FLINT and proof of its adaptability to your business.

Dealers:—

This commercial car will make your business grow by giving your patrons the kind of service they want at a price they are willing to pay. It's a profitable car to carry. We have some desirable territory open—write us today about your locality.

Durant-Dort Carriage Co., Flint, Mich.



A Continuous Procession
of Trucks Equipped with

Phineas Jones & Co. Wheels

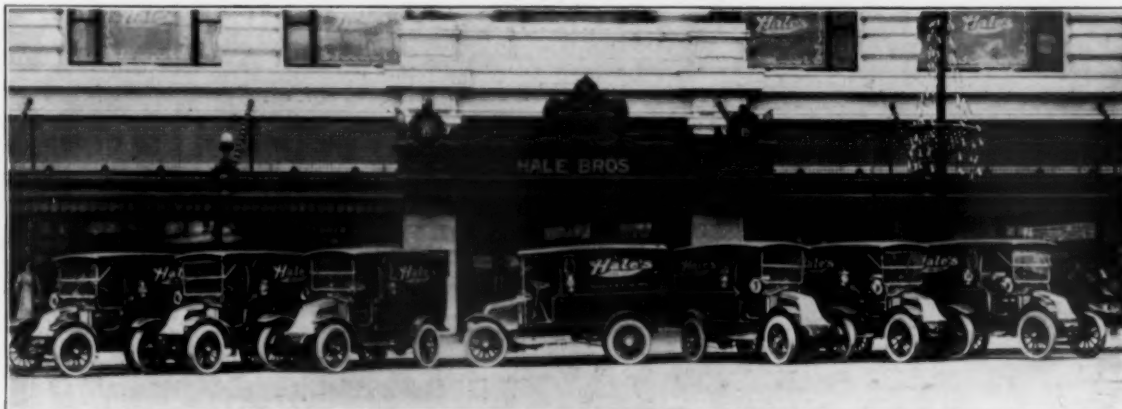
can be seen in almost
any large city, any time

The knowledge, experience and ability that comes from 58 continuous years of successful wheel making are concentrated in our product. Because of their past records, their present performances, and their unexcelled quality, truck makers and owners put them on their cars with a feeling of absolute confidence.

PHINEAS JONES & COMPANY
Established 1855

305 Market St., Newark, N. J.
12th Ave. & 55th St., New York, N. Y.
1625 South Los Angeles St., Los Angeles, Cal.

When Writing, Please Say—"Saw Your Ad. in the C C J"



Silent **Lippard-Stewart** Powerful

Worm Drive Sets a New Standard for Truck Service

With motor trucks, like all business appliances, the demand for the highest type of service comes with their increased use. But with trucks having chains and sprockets or double gear reductions, the limit of perfection has been reached. Here the Lippard-Stewart worm and gear steps in to meet a standard beyond the reach of less up-to-date drive systems. No longer is absolute satisfaction a thing to be hoped for; with Lippard-Stewart worm drive it is a fact backed by actual evidence.

The Old Way and the New

While chains are exposed to dirt and grit, Lippard-Stewart worm drive is entirely enclosed and runs in a bath of oil. Wear on the worm and gear is almost nothing—it is a big item in other systems. Power in the Lippard-Stewart goes from motor to wheels through one set of gears—in other trucks there is a maze of mechanism. The action of the worm and gear is absolutely silent—the noise of other trucks means excessive wear. Chains and sprockets and double reduction axles lose from 10% to 15% of motor power in carrying it to the rear wheels—Lippard-Stewart worm drive is 97% efficient.

DEALERS: The Lippard-Stewart line covers a field for trucks where the possibilities for sales are the greatest. The trucks are abreast of the times—not back numbers. The sale of Lippard-Stewarts is a proven money-maker. Our dealership in your territory may be open. Write for our proposition.

Big Firms Place Repeat Orders

The story of the successful operation of Lippard-Stewart trucks is written in the second, third and fourth orders from concerns of established business foresight, such as:

| | | |
|---------------------------------|---------------------|--------|
| The Philadelphia Company | Pittsburgh, Pa. | Use 5 |
| Kolb Baking Company | Trenton, N. J. | Use 2 |
| Bon Marche | Seattle, Wash. | Use 5 |
| Pacific Hardware & Steel Co. | San Francisco, Cal. | Use 2 |
| Hale Brothers | San Francisco, Cal. | Use 9 |
| Loffler Sausage & Provision Co. | Washington, D. C. | Use 3 |
| M. Albert's Sons | Baltimore, Md. | Use 2 |
| Fishers Bakery | Oakland, Cal. | Use 2 |
| Boggs & Buhl | Pittsburgh, Pa. | Use 4 |
| H. S. Barney Co. | Schenectady, N. Y. | Use 2 |
| Hosler Ice Cream Co. | Buffalo, N. Y. | Use 6 |
| Barber & Ross | Washington, D. C. | Use 2 |
| Oakland Cream Depot | Oakland, Cal. | Use 2 |
| The White House | San Francisco, Cal. | Use 2 |
| Buffalo Courier | Buffalo, N. Y. | Use 10 |
| Louis K. Liggett Co. | New York City | Use 2 |
| The Larkin Co. | Buffalo, N. Y. | Use 4 |

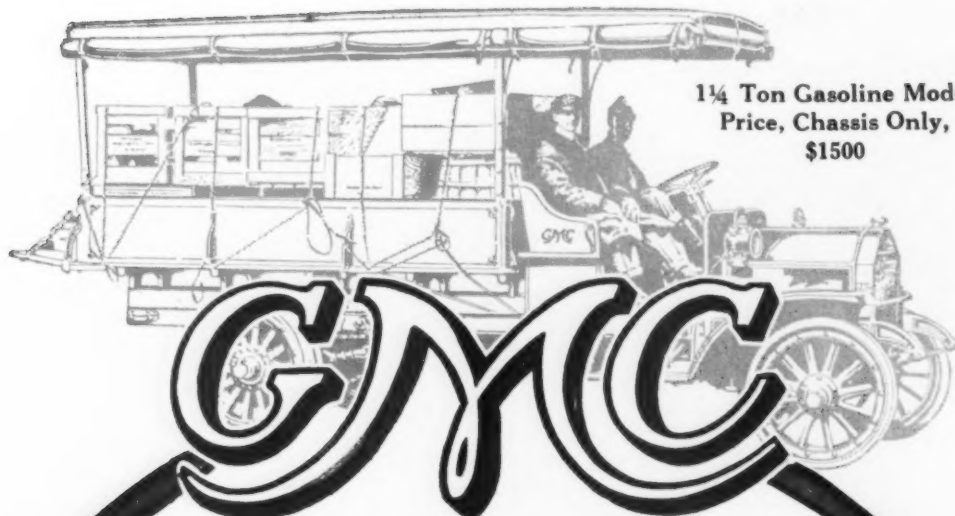
Endorsements of this kind by experienced investors in motor trucks and the country-wide satisfactory performance of the Lippard-Stewarts in sixty lines of trade is final proof that the trucks have produced the results expected of them.

1500 Lbs. and 1½ Tons Capacity

Lippard-Stewarts are built in sizes suitable for the majority of purposes. The first high-grade light-capacity truck selling for a reasonable price is found in the delivery car model, bevel drive (pneumatic tires), \$1650 for the chassis; worm drive (solid tires), \$100 extra. Model F, worm drive, \$2300 for the chassis, embodies all the modern features of truck construction. Its advanced design places it as a leader among trucks of its rating. Get the details of these two cars before you now. Write for literature.

Lippard-Stewart Motor Car Co.

1737 Elmwood Avenue, Buffalo, N. Y.



1 1/4 Ton Gasoline Model
Price, Chassis Only,
\$1500

GENERAL MOTORS COMPANY TRUCKS

Have the Service Built In

The increased demand for GMC trucks is substantial proof that those who need trucks approve of our product and our policy. GMC trucks are high grade.

There are no better trucks built than those going from our factory every day. Get that fact fixed in your mind. And then this one: We do not build cheap trucks.

Our prices are lower than other high grade trucks, because we have *increased* our production and *decreased* our overhead by eliminating the extravagant methods that still obtain in many factories—methods which increase the cost without adding to the quality. We are price *reducers* not price *cutters*. Our service is more than conversation—it is built *into* the truck and written

in the order, it is the service that satisfies. We perform all we promise. If you need trucks it will be to your interest to investigate GMC trucks and GMC methods *before* you place an order.

Satisfy *yourself*—our competitors might not have first hand information. We make a truck to fit *your* business.

GASOLINE From 1 1/4 ton at \$1500
to 5 ton at \$3000
(Chasses)

ELECTRIC From 1000 lbs. at \$1200
to 12000 lbs. at \$2500
(Chasses Less Battery)

Correspondence invited with dealers of financial responsibility

GENERAL MOTORS TRUCK COMPANY

One of the Units of the General Motors Company

Pontiac

Michigan

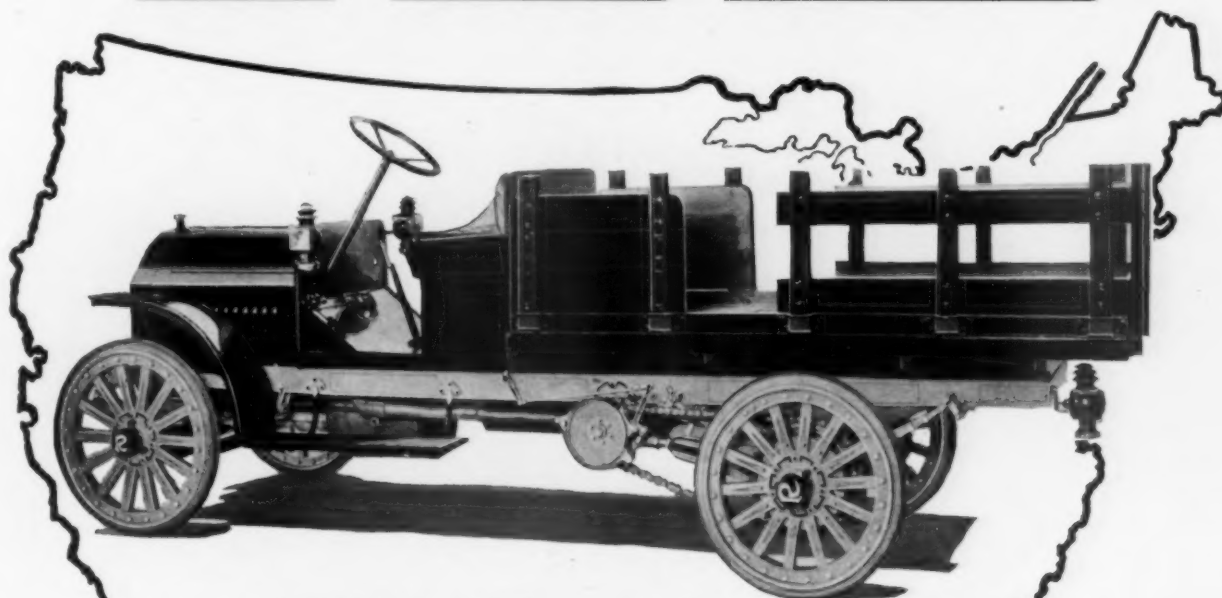
Branches:—New York, Boston, Chicago,
Philadelphia, Kansas City,
Detroit, St. Louis

When Writing, Please Say—"Saw your Ad. in the C C J"

REPUBLIC TRUCKS

INSURE SERVICE

ON THE MAP!



\$1350 (Chassis) One Ton Capacity

Dealers: How about your town?

Live dealers are wanted everywhere—in your town, if we are not already represented there. The **REPUBLIC ONE-TON TRUCK** is assuredly on the map and here to stay. Our output for 1914 is figured very high and the price low. You can make money selling this truck, because it has every element of success. It is the type and capacity truck to meet the strongest demand in the field today.

Alma Motor Truck Company

General Sales Offices, 880 Woodward Ave., Detroit, Mich.

Alma, Michigan



When Writing, Please Say—"Saw Your Ad. in the C C J"

REPUBLIC TRUCKS

INSURE SERVICE

Facilities



This factory, at Alma, Michigan, is one of the most complete truck plants in the United States. It has 75,000 square feet of floor space, all devoted to the production of **REPUBLIC ONE-TON TRUCKS**. The equipment is of the most modern character and designed especially for high-grade truck manufacturing purposes. Every possible arrangement has been made to facilitate careful production and prompt shipments, and we are in position to take care of our dealers, giving them **trucks that will sell**, in quantities that make it **profitable** to sell, and at the time when you need them the most.



Alma Motor Truck Company

Alma, Michigan

General Sales Offices, 880 Woodward Ave., Detroit, Mich.

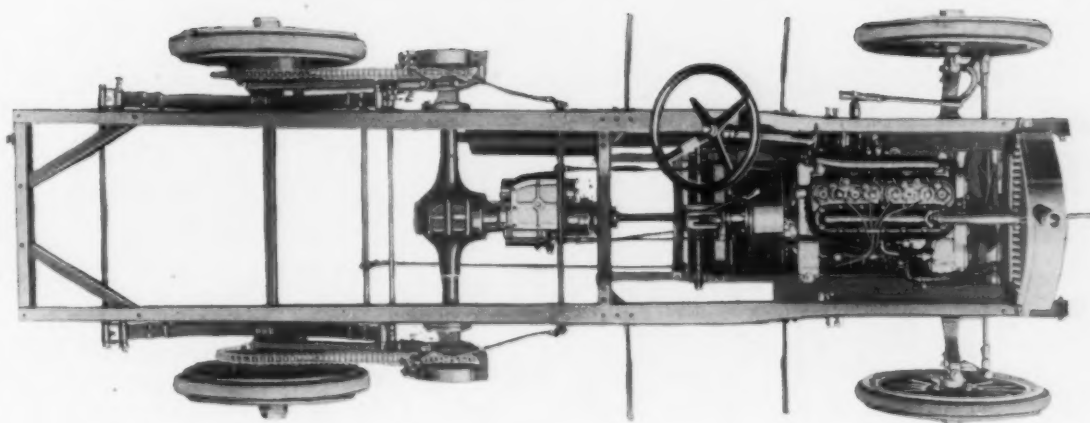


When Writing, Please Say—"Saw Your Ad. in the C C J"

REPUBLIC TRUCKS

INSURE SERVICE

Construction



When we say that **REPUBLIC** construction is standard, we mean all that this much-abused word really implies. It is standard because the fundamental idea underlying the construction of the truck has been to avoid **experiments, hobbies and freak features**, and to incorporate only those parts which, in the battle of service, have earned the right to be called the best of their kind produced. Those parts are made by specialists who make their products so good that the prestige of their names will help you sell the **REPUBLIC**. High Quality is shown by the following

Brief Specifications:

Continental Motor
Schebler Carburetor
Eisemann Magneto
Russel Jack Shaft

Hyatt Roller Bearings
Hartford-Type Joints and Clutches
Culver-Taylor Chains

Covert Transmission
Lewis Springs
Left-Hand Drive
Center Control

Alma Motor Truck Company

Alma, Michigan

General Sales Offices, 880 Woodward Ave., Detroit, Mich.



When Writing, Please Say—"Saw your Ad. in the C C J"

REPUBLIC TRUCKS

INSURE SERVICE

Dealers' Opportunity

You dealers are constantly being assailed with "Opportunities"—many of which are hardly worth consideration. But keen, aggressive dealers find an opportunity here and there that fairly dazzles with possibilities. Such is the **REPUBLIC**.

There is nothing experimental about the **REPUBLIC** truck, its sale or its service.

Its quality is vouched for by the array of famous manufacturers who back up the various parts.

Its salability has been proved by scores of dealers who have taken agencies to their great financial profit.

Its service-giving qualities have been and are daily being proved in many lines of business.

Its capacity is that desired by the greatest number of truck prospects.

Its price is low for the quality, and one that a merchant will readily pay.

The production and delivery facilities of the producing company are all that could be desired.

The **REPUBLIC** is a truck that will emphatically make good for both the dealer and the user.

Look over your field now and see the hosts of prospects in your territory for the **right** kind of truck. Consider all the merchants who could improve their delivery service and reduce its cost by substituting the **REPUBLIC** for horse-drawn equipment. Take down your telephone book and city directory. Go through them and see what a surprising number of really good prospects there are for a **high-class, proven truck** like the **REPUBLIC**.

We are constantly stirring up prospects for dealers and helping them close sales. They are making money—so will **you** if you join the **REPUBLIC** family. This is a **real opportunity** to make big profits selling the logical truck. Write at once for our interesting sales proposition.

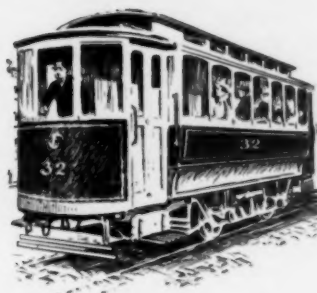
Alma Motor Truck Company

Alma, Michigan

General Sales Offices, 880 Woodward Ave., Detroit, Mich.



When Writing, Please Say—"Saw Your Ad. in the C C J"



1500 000 MILES

is about the distance that 32 cars have been driven in New York City during the past three years by the

Gould Storage Battery Gould

THESE were the first successful storage-battery-driven cars and still give splendid service at very profitable operating cost.

The Gould Storage Battery for automobile propulsion is identically the same as drives each of the above cars over 120 miles per charge

The Gould Storage Battery has maintained its supremacy strictly upon merit and our liberal treatment to customers.

Our automobile types are made throughout with the same care and skill as the batteries which we constantly furnish for the largest engineering propositions.

Prospective customers will gladly be given the advice of our engineering department as to the best type and size of battery for any given installation.

Gould battery renewals fit jars of any make.

Gould Storage Battery Co.

General Offices: 30 East 42nd Street, New York City

Boston, 14 Cambria Street
Philadelphia, 613 Betz Bldg.
Cleveland, Amer. Trust Bldg.

Detroit, Beyer Bldg.
Chicago, The Rockery
San Francisco, 994 Rialto Bldg.

WORKS: Depew, New York

Agents

WASHINGTON
KANSAS CITY
DENVER

TOPEKA
LOS ANGELES
SEATTLE

Canadian Representative: R. E. T. PRINGLE

Montreal Toronto Winnipeg Vancouver

Full stock carried at all cities where we have offices or agents

92



IF

Your Automobile
Is Equipped With a

Pyrene

FIRE EXTINGUISHER

You Can Secure
15% Reduction

In Your Fire Insurance Premiums

Pyrene is the only effective extinguisher on highly inflammable fires, such as oil, gasoline, calcium carbide.

Pyrene will not freeze at sixty degrees F. below zero and is good until used, for it does not deteriorate, neither can it evaporate from the container.

Pyrene is non-damaging and non-corrosive.

Pyrene extinguisher is easily operated by man or woman and can be refilled as readily as a kerosene lamp.

NOTE—Pyrene brass and nickel-plated are the only type of fire extinguishers that qualify to obtain the 15% insurance reduction.

The Aetna Accident and Liability Co. and the Automobile Insurance Co. of Hartford, Conn., allow this reduction—See their agents or consult your own broker.

At all first-class auto supply dealers. Send postal to nearest branch for booklet—proving the service and true economy this scientific fire fighter brings to you.

Brass and Nickel-Plated Pyrene Fire Extinguishers are the only one-quart Fire extinguishers included in the lists of approved Fire appliances issued by the National Board of Fire Underwriters.

Pyrene Manufacturing Co., 1358 Broadway, New York

| | | | | |
|-----------------|------------|--------------|---------------|----------------|
| Alton | Buffalo | Detroit | New Orleans | Richmond |
| Anderson, S. C. | Chicago | Duluth | Norfolk | St. Louis |
| Atlanta | Cincinnati | Jacksonville | Oklahoma City | St. Paul |
| Baltimore | Cleveland | Louisville | Phoenix | Salt Lake City |
| Birmingham | Dayton | Memphis | Philadelphia | San Antonio |
| Bridgeport | Denver | Milwaukee | Pittsburgh | York, Neb. |
| Boston | | | | |

Pacific Coast Distributors: Gorham Fire Apparatus Co.
San Francisco Los Angeles Seattle

Distributors for Great Britain and the Continent:
The Pyrene Co., Ltd., 19-21 Great Queen Street, London, W. C.

BUDA MOTOR

"The part that sells the truck"

has taken contracts away from competitors at higher prices, at lower prices, at equal prices.

Because, on scientific **laboratory** tests, on **factory** tests, on practical **road** tests, on the test of the **sales floor**, and on the greatest test of all—long years of **use**—BUDA Motor shows the good qualities that only the best can have.

Truck Owners are as much interested in this as Truck Manufacturers

THE BUDA COMPANY

FACTORY, HARVEY, ILL., (Chicago Suburb)

Address all correspondence to our **FACTORY REPRESENTATIVES**

BRANDENBURG & COMPANY

1108 S. MICHIGAN AVE., CHICAGO

FORD BUILDING, DETROIT

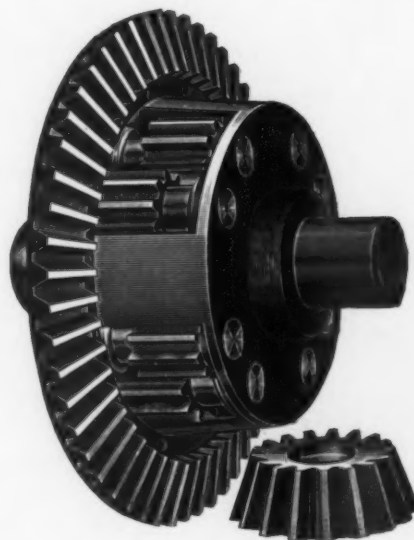
57TH & BROADWAY, NEW YORK CITY



CULLMAN SPROCKETS and Differentials

in stock and to
order.

Send for catalog
and let us quote
you on your re-
quirements.



CULLMAN WHEEL COMPANY, CHICAGO
1351 GREENWOOD TERRACE

When Writing, Please Say—"Saw Your Ad. in the C C J"

HESS-BRIGHT

Ball Bearings



Resources may not be an argument to the man who is looking for Quality.

Yet the fact that we have the largest plants in the world devoted exclusively to the manufacture of ball bearings should convince you that **RESOURCES** plus **QUALITY** are both behind **HESS-BRIGHT (DWF) BALL BEARINGS**.

THE HESS-BRIGHT MANUFACTURING CO.

Front Street and Erie Avenue, Philadelphia, Pa.

STORES FOR RETAIL DISTRIBUTION

Philadelphia
666 N. Broad Street

New York
1974 Broadway

Chicago
1800 Michigan Avenue

KONIGSLOW

CLEVELAND

can solve your clutch problem



If you are one of those concerns who are rather keen on details you know that the **CLUTCH** talks.

It's the most frequent point of contact between driver and car. **KONIGSLOW'S CLUTCHES** will speak as forcefully for you as they do for **KONIGSLOW**

Don't wait till you are ready to place orders—write today to

**KONIGSLOW
CLEVELAND**

**For
Clutches
Clutch Rocker
Shafts
Control Levers
Universal Joints**

**The Otto Konigslow Mfg. Co.,
Detroit Office
J. H. GOULD
1202 Majestic Bldg.
Cleveland**

When Writing, Please Say—"Saw Your Ad. in the C C J"

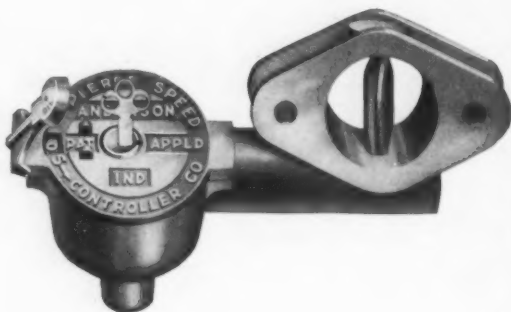
5000

Pierce Speed Controllers

In Use in 1913

Averaged less than 14 cents each for repairs. Saved thousands of dollars in up-keep.

Can be applied to your car by anyone



Prevent overspeed, the greatest known destroyer of Commercial Cars.

The Pierce Speed Controller Co.

Anderson, Indiana, U.S.A.

There Is Good Territory Open
for the Sale of

CROCE

MOTOR TRUCKS



3/4, 1, 2 and 3 Ton Trucks

Dealers who are desirous of handling a high-class truck of proved ability that justifies strong arguments, gives complete satisfaction and builds up a business, are invited to investigate the CROCE. It will be found to excel in these very essential factors—quality, economy, efficiency, durability and value.

Consider these points for a moment:

QUALITY—that is proved by the parts used, such as Timken Axles, Wisconsin Motors, Spicer Universal Joints, Schwarz Wheels, Kells Radiator, Bosch Magneto, Brown-Lipe Transmission, Schebler Carburetor, and other equally high-class parts.

ECONOMY—The CROCE distinctive design causes the weight to be one-fourth less than other trucks of similar capacity. This saves enormously on tires and gasoline and makes operation very economical.

EFFICIENCY—In every line of business in which it has been used it has made good. The best proof of this is the fact that we get repeat orders from nearly every customer.

DURABILITY—The CROCE is built so well that it gives long-continued and satisfactory service. The first CROCE built is still in active service after years of usage. The construction is such that every buyer has the right to expect a similar record.

VALUE—There is full value for every dollar in CROCE trucks, and in the long run they are much cheaper than those whose first cost is less.

If these qualities appeal to you as being what you and your trade want, write us for complete descriptions, territory, terms, etc.

CROCE AUTOMOBILE CO.
ASBURY PARK, N. J.

The Wonderful Records Made by **BESSEMER TRUCKS**

throughout the country, during the recent blizzards, resulted in
Numerous Re-Orders

Strenuous service has no terrors for the Bessemer Truck. Each truck, before leaving the factory, must go through a test that is 100% more severe than it will ever receive in service. Sturdiness is built into every Bessemer, from radiator to tail gate.

DEALERS: Write us about a special proposition we have to offer you. The truck that brings re-orders from the largest representative concerns throughout the country, is the truck for you to handle.

THREE MODELS:

- MODEL C, 25 H. P., \$1250
1 Ton Capacity—Chain Drive
- MODEL A, 30 H. P., \$1800
1½ to 2 Ton Capacity—Chain Drive
- MODEL D, 30 H. P., \$2300
1½ to 2 Ton Capacity—Worm Drive

Bessemer Motor Truck Co.
GROVE CITY, PA.

Boston — Branches — Pittsburgh
A. C. Vanderpool, 18 Broadway, New York City, Export Rep.



The Ultimate Drive

We
Have
The
Largest
Equipment



We
Have
The
Largest
Experience

WHY EXPERIMENT WITH EXPERIMENTERS?

The Cleveland Worm and Gear Co.

988-992 East 67th Street, Cleveland, Ohio

When Writing, Please Say—"Saw Your Ad. in the C C J"

YOU KNOW

with absolute certainty just what you need to know—how far your trucks have traveled, the ability of your drivers, the vehicles which are not profitable, and everything pertaining to mileage, if each of your trucks is equipped with a

Veeder HUB ODOMETER



Model K, shown above, is the latest addition to the VEEDER family. It is especially designed to withstand vibration and is a compact, rugged instrument, which will give a faithful and accurate record of every mile traveled.

It records whether the truck is run backwards or forwards; it cannot be made to lie; its records cannot be altered, and there is no way in which a driver can evade its statement of work done.

Model K is very durable, the wearing parts being made of hardened steel, the dials and gears of brass or bronze, the casing of brass. There are no springs and but little friction. It means money in your pocket to place them on your trucks.

FORM K
\$20

At your dealers, direct from factory, or the following:

T. H. CRANSTON & CO.
56 E. Randolph St.
Chicago

BERNARD I. BILL
543 Golden Gate Ave.
San Francisco, Cal.

The Veeder Manufacturing Company

C. H. VEEDER, President D. J. POST, Treasurer
H. W. LESTER, Secretary

Hartford, Conn.

Makers of Cyclometers, Odometers, Tachometers, Tachodometers,
Counters and Small Die Castings

Chilton Advertising Post Cards

in colors should be
included in every
advertising campaign

Your prospective customer *may* see your catalog or magazine advertisement, but he is sure to read your CHILTON POST CARD.

The use of the post card in colors is the modern way to advertise and economize. It is a *personal-appeal* form of publicity which invariably attracts attention, and is sure to land orders.

Forward us your printed matter, state what you want to advertise and how many cards you can use, and we will do the rest.

**CHILTON
COMPANY**

Market & 49th Streets
PHILADELPHIA, PA.

POLACK

TYRES

INSURE TRUCK SERVICE

Experienced users keep their trucks continually in service
by applying Polack European Standard tyres exclusively.
Guaranteed for 10,000 miles and invariably run more.

RESILIENT

EFFICIENT

ECONOMICAL

POLACK TYRE & RUBBER CO.

246 W. 59th Street, New York

Albany
Baltimore
Boston

Chicago
Cleveland
Dayton

Detroit
Kansas City
Montreal

Newark
New Haven
Philadelphia

Providence
St. Louis
Washington

Factory:
Bridgeport, Conn.

THE COMMERCIAL CAR JOURNAL

is the logical paper for every man to read who contemplates buying or selling commercial motor cars. It is brimful of essential information.

The Commercial Car Owner will also find many suggestions in it that will make his driving more efficient. Send for a sample copy.

Commercial Car Journal

Market and 49th Sts., Philadelphia, Pa.



PLAIN COMPRESSION
(Patented)

Empress

BRASS AND STEEL

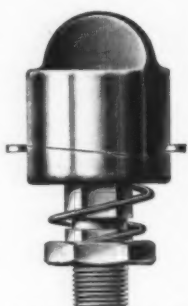
GREASE AND OIL CUPS

WE MANUFACTURE
a full line of Plain, Leather
Packed, Ratchet, Marine,
Spring Compression, and
many other styles of Grease
Cups.

Our line of Oil Cups is
equally satisfactory and
complete.

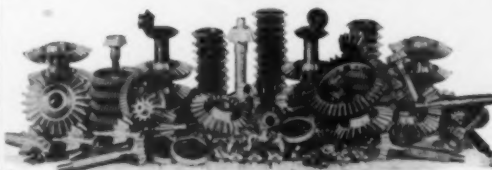
Catalogue on Application

Bowen Manufacturing Co.
AUBURN, N. Y.



WING TOP RATCHET
(Patented)

GEARS



GEARS

Bevels
Spurs

Mitres
Spirals
Sprockets

Worms
Racks

GEARS

We produce in quantities to specification cut and
planed Gears and Pinions of all descriptions.
As a source of supply in connection with *Gears*
and *Gear Cutting*, we are considered an asset by
many of the best interests. They buy from us year
after year, because these advantages are afforded:

- (1) *Unexcelled facilities.*
- (2) *The highest standard of workmanship.*
- (3) *Years of experience as specialists in gearing.*
- (4) *A most careful selection of materials.*
- (5) *Particular attention to deliveries.*

THE VAN DORN & DUTTON CO.

Gear Specialists
CLEVELAND (Sixth
City)

GEARS

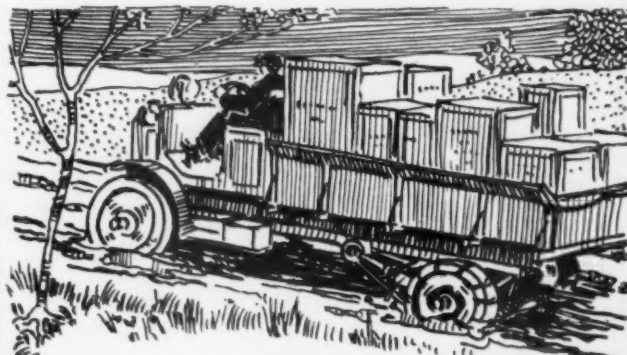
ROSS

STEERING and DIFFERENTIAL GEARS

are standard on good
motor truck
construction

WRITE FOR CATALOG

ROSS GEAR & TOOL CO.
790 Heath St. :: Lafayette, Ind.



Spring's Muddy Roads

have no terrors for the truck equipped with

BRO-GOR TRUCK CHAINS

neither have slippery pavements, steep hills, sandy places, or any con-
dition where it is hard to obtain traction. BRO-GOR CHAINS will
always afford traction, prevent skidding, are easier to attach or take off,
more durable and less wearing on the tire.

BRO-GOR CHAINS are different from all others and far more efficient.
Each unit consists of a clamp to be fastened to the spoke, a cross section
presenting a flat surface to the tire and a repair link connection. They are
placed on alternate spokes and the six or seven units thus employed are more
effective than twelve or more of the ordinary type.

Summer or winter or any time in between, your truck has need for BRO-GOR
CHAINS. Write us for further information. Good territory open for dealers.

The Brockett-Gorham Company
Marion, Ohio

Three Selden Trucks Save \$3400 in Four Months

Three Selden Trucks effected a saving of \$3400 in our carting for the four months ending Oct. 31st, 1913, as compared with the same period of the previous year, when horse-drawn vehicles were used. (Signed) Wm. Knabe & Co., New York, Manufacturers of Knabe Pianos.

Here is the business proposition we offer every reliable firm—

\$500 Will Put The \$2000 Selden Truck Into Your Service

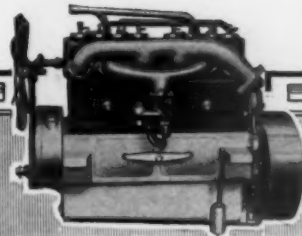
and the truck itself will earn the remaining monthly payments.

Users and Dealers find that the Selden Truck is the most satisfactory 3,000 lb. truck on the market, not only because it is economical to run, but because by building every part, from frames and axles to the smallest rivet, extra large and strong, we have put service into the truck itself and made it a truck that will last.

We want dealers in unassigned territory who know how to sell commercial vehicles—who know how to size up a man's truck needs and advise him properly. We want dealers who recognize that the Selden Truck plus the Selden Sales plan is a business proposition for business men.

Selden Truck Sales Company

403 East Ave., Rochester, N. Y.



WAUKESHA

4 1/4 x 6 1/4 LONG STROKE TRUCK MOTOR.

EFFICIENCY is the Waukesha Motor's best eulogy. It is efficient because it is constructed to give the utmost in service.

The Waukesha crankshaft has a tensile strength of 70 tons. The bearings have three times the wearing quality of ordinary bearings. Both these metals are our own processes. The rest of the motor is on par with these two features. When we can prove all this, why not ask us to?

Why not learn that you can put a motor in your trucks that will exceed your broadest guarantee of efficiency, wear and economy of fuel? Your request will bring proof that will leave no doubt of the Waukesha Long-Stroke Motor's supremacy.

WAUKESHA MOTOR CO.

WAUKESHA Dept. A. WISCONSIN

AN EXCEPTIONAL MOTOR.

Motor Truck Bands

MADE WITHIN THE FOLLOWING

Dimensional Tolerances

(ADOPTED BY THE SOCIETY OF AUTOMOBILE ENG.)

1.—Tolerance in circumference of felloe band:

| | | Plus | Minus |
|-----------------------------|-----|-------|-------|
| Before application to wheel | - - | 1-32" | 1-32" |
| After | - - | 1-16" | 1-32" |

Variation from precise measurement shall be uniform over entire width of band.

2.—Tolerance in width of felloe band:

| | | Plus | Minus |
|------------------------|-------|-------|-------|
| Up to and including 4" | - - - | 1-32" | 1-32" |
| 4-1.16" to 6" | - - - | 3-64" | 3-64" |
| 6-1.16" to 12" | - - - | 1-16" | 1-16" |

3.—Variation in trueness of band when placed on surface plate: Band shall touch at all points within 1-32" up to and including 6" width. Over 6" width within 1-16".

4.—Variation in thickness of band: .006" plus or minus.

5.—Trueness to round. The radial tolerance on the wheel when felloe band is applied shall be 1-16" plus or minus. This plus or minus tolerance must not occur at diametrically opposite points. There shall be no flat spots or kinks in felloe band on the finished wheel.

The Standard Welding Company

CLEVELAND

NEW YORK

CHICAGO

DETROIT

The Lavigne Gear Co.

Pioneer
Truck Steering Gear
Manufacturers

FOR

Trucks, Pleasure Cars and Tractors

WE FURNISH OUR GEARS WITH DRAG LINKS
WRITE FOR BLUE PRINTS

RACINE, WISCONSIN



Sternberg TRUCKS

2, 2½, 3, 4, 5, 6, 7 TONS

The third most used truck in Greater New York. Only four or five trucks its equal in strong construction, low upkeep and ability. Special bodies designed.

WORM-DRIVE, 2½ TON

A new achievement in reducing unsprung weight and friction—silent—set a new low haulage cost for trucks of this capacity. **Write for special circular.**

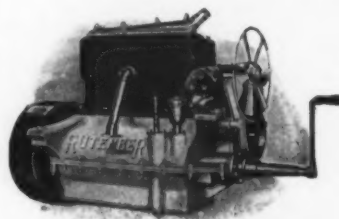
STERNBERG MFG. CO., West Allis, Milwaukee, Wis.

THE RUTENBER MOTOR

Manufactured since 1901 for high-grade

Automobiles and Trucks

3¾ x 5¼ four, and six cylinder
4¼ x 5¼ four cylinder standard or unit and
4 x 4 and 4½ x 5½ standard types, all L-head, 4-cycle.



Manufacturers are invited to investigate our service and our facilities. Literature on request.

The Rutember Motor Company
MARION, INDIANA

COTTA TRANSMISSIONS



Internal View of Shaft-Drive Transmission,
designed for use in worm-drive trucks

For Heavy Truck and Tractor Service Eliminate Transmission Trouble

Selective type, individual clutch system. All gears always in mesh. Countershaft and mainshaft gears idle on direct. Improved speed-changing device. No plain bearings—loose gears mounted on roller bearings.

Write for Bulletin

COTTA TRANSMISSION CO.
814 So. Main Street Rockford, Illinois



PALMER-MOORE

For Dependable Service

Air-Cooled Water-Cooled



Palmer-Moore Open Express Body
Price (Water-Cooled), \$1425

Economy in motor delivery is not an experiment with **Palmer-Moore** owners—it is an assured fact—the best investment and the strongest kind of an advertisement.

The smooth-running qualities and clean-cut appearance of **Palmer-Moore** trucks give them the same position in the commercial world occupied by the finest passenger cars in the pleasure field—that of distinction and merit.

Wherever light delivery trucks are needed there is a possible sale for a **Palmer-Moore**.
1600 lbs. Capacity. All Styles of Bodies

PALMER-MOORE COMPANY
SYRACUSE, N. Y.



SPLITDORF PLUGS

are the real standard of plugdom—soot-proof, gas-proof, and unbreakable.

SPLITDORF PLUGS are ECONOMIC in that they "stand up" under the hardest usage better than any other plug on the market.

Insist upon SPLITDORF.

Write or call today upon our nearest Branch House for full information

SPLITDORF ELECTRICAL COMPANY

| | |
|-------------------------------|-------------------------------|
| ATLANTA...10-12 E. Harris St. | NEWARK...290 Halsey St. |
| BOSTON...180-182 Mass. Ave. | NEW YORK...18-20 West 63d St. |
| CHICAGO...64-72 E. 14th St. | PHILA...210-12 N. 13th St. |
| CINCINNATI...811 Race St. | SAN FRANCISCO 1028 Geary St. |
| DALLAS...402 S. Ervay St. | SEATTLE...1628 Broadway |
| DETROIT...972 Woodward Ave. | TORONTO...469 Yonge St. |
| KANSAS CITY 1823 Grand Ave. | DAYTON...MINNEAPOLIS |
| LOS ANGELES 1226 S. Olive St. | LONDON...BUENOS AIRES |



"The Coventry" Detachable Roller Chain

Note the large heavy-duty cotter-pin connecting the two rivets. The mechanical superiority of this method of coupling can easily be appreciated. Vibrations and jars cannot weaken the double-size coupling as is the case where two smaller cotter-pins, one for each rivet are employed.

Combine the established reputation of "The Coventry" Chains for precision, perfect retention of pitch and unparalleled durability with this final touch of perfection and you will understand why "The Coventry" Chains are consistently specified by those desiring the maximum of transmission efficiency.

Our catalog comprehensively covers "The Coventry" line, and will be sent immediately upon request.

Herbert F. L. Funke Co., Inc.
Dept. V 116 Broad Street New York

Substantial Commercial Success is Never Accomplished—

except on merit—sound fundamentals—quality that overcomes competition.

There is no stronger argument for the American-made New Departure Ball Bearing than the two thousand skilled mechanics who are producing ten thousand guaranteed bearings per day, to meet actual demand of the American manufacturer, who must be certain that every component of his car will add to its salability and reputation.

We are the largest manufacturers of ball bearings in the world. There's a reason.

Write for literature today

The New Departure Mfg. Co.
Bristol, Connecticut

Western Branch: 1016-17 Ford Bldg., Detroit, Mich.

Make your motor truck as easy to handle and as economical in upkeep as a pleasure car, by installing



SIMPLE—STURDY—ACCESSIBLE

Dyneto-Entz
TRADE MARK

Electric Starter and Lighting System

Don't expect your driver to break his back cranking a big engine. He would rather let the motor run from morning till night. You pay for gasoline—he doesn't. When your truck stalls on the road or in traffic, think of the time it takes the driver to get under way again.

Give Your Truck Driver the Dyneto-Entz Starter

The truck manufacturer can make room on any new car for the Dyneto-Entz. On an old car a garageman or mechanic can find room for the Dyneto-Entz. One Switch does away with all other controls. A single unit motor generator not only starts the engine every time, but keeps the storage battery charged. The storage battery can not be overcharged. The wiring is simple.

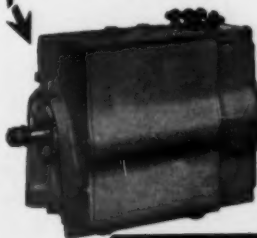
The Dyneto-Entz means that you never have a Stalled Car. Standard Equipment on Franklin, White, Tribune, Stewart, Chase and Other Cars.

Write for Full Particulars

Dyneto Electric Co.

Dept. M SYRACUSE, N. Y.

Sales Agent: T. J. WETZEL, 17 W. 42nd Street, New York City



When Writing, Please Say—"Saw Your Ad. in the C C J"

Which Truck Is Best of the Famous Big Four?

Experienced buyers of motor trucks now choose between four great makes. Each of the four is backed by millions. All are in the business to stay. Among them competition is keen. Almost daily, keenly competitive tests between these four great makes of trucks are establishing which is the best. For all are in use by the largest corporations—who use trucks by the dozen.

In pulling power the Velie Truck, the only one of the big four unadvertised until now, proves that a more powerful, slower running motor will in competitive tests out-pull and out-wear all high-speed, small-powered motors.

In three-ton trucks all four makes have 5 or 6 inch frames—channel shaped, or I-beam. But the Velie in addition to having a 6-inch I-beam frame has a 4-inch sub-frame. And in heavy hauling this extra sub-frame proves its wonderful worth.

Experienced buyers can tell by comparison of specifications why it is that the Velie is winning the fiercely competitive tests between the four best makes of trucks.

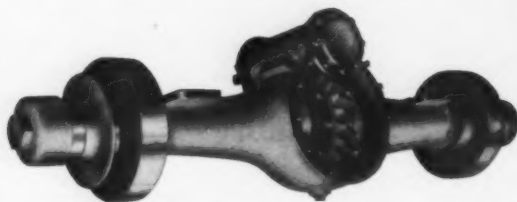
Any Velie agent has these truck contest results on file—they are convincing—ask to see them.



Velie

Velie Motor Vehicle Company - Moline, Ill.

HINDLEY Worm-Gear Axle



The drive that makes a truck really efficient and profitable

The embodiment of this drive in a truck assures longer service, greater efficiency, less expense, lower operating cost.

This is not merely theory, but facts proved by experience. So firmly established have become the advantages of the Hindley Worm-Gear Axle that its presence in a truck is both an assurance of its worth and an argument for its sale.

It is to your interest to inquire about this drive for the trucks you build. The services of our engineering department are at your command.

HINDLEY GEAR COMPANY
1105 Frankford Avenue Philadelphia

—ACME— Universal Joints

These are the best universal joints that a truck manufacturer could put in his product. They embody every essential feature necessary to make it the nearest perfect Universal Joint for use in trucks.

ACME JOINTS are remarkable for their simplicity and durability and are best adapted to withstand the severe wear and strain to which they are subjected in motor truck usage.

The ACME can be removed from a car without moving a unit of the power transmission. This feature alone gives it a great advantage over any other joint on the market.

They are so accurately made that they are interchangeable and necessary repairs can be made without difficulty.

Ask us to prove that Acme Joints are better than those you are now using—we'll do it.

The Acme Universal Joint Mfg. Co.
1421 Fulford Street, Kalamazoo, Mich.



KOEHLER

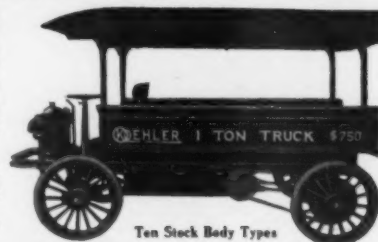
ONE TON TRUCK \$750.

A Profitable Truck to Sell

The KOEHLER is profitable to sell because it is the type, size and capacity truck that is most in demand; because it offers both the lowest price and greatest value of all ton trucks; because its range of stock bodies adapts it to almost every kind of business, and because the one chassis and small investment make quick and frequent turn-overs of your capital.

24 H.P. Water-cooled motor, 2 inch axles, 36 inch demountable tires, positive lubrication, float feed, automatic carburetor, high-tension magneto.

Write for full details. State territory desired.



Ten Stock Body Types

H. J. KOEHLER S. G. COMPANY
1709 BROADWAY, NEW YORK

Spicer Universal Joints



Universally Accepted as the Most
Dependable Flexible Connection
Known to Motor Car Practice

Oil-Tight Dust-Proof

PARTS INTERCHANGEABLE

Spicer Manufacturing Company
Plainfield, N. J.

Sales Representatives:

K. Franklin Peterson, 122 S. Michigan Blvd., Chicago
L. D. Bolton, 2215 Dime Savings Bank Bldg., Detroit
Thomas J. Wetsel, 17 W. 42d St., New York
Foreign: Benjamin Whittaker, 21 State Street, New York

A Strong Plug for Heavy Work



You can't expect a brittle Spark
Plug to stand the strain and
jars of your motor truck. Plugs
insulated with porcelain, mica,
etc. are bound to break.

HERZ PLUG

"Bougie Mercedes"

is an exquisite combination of
STONE and STEEL. It is
made to stand up, and it does.
Its insulation is

Double Unbreakable Stone

It is Blue Enameled. HERZ PLUG has Four Sparking
Points of Platinum-Alloy, which ensure a fat, hot spark at
all times. It is Self-Cleaning and

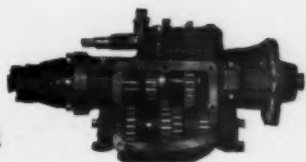
Guaranteed a Full Year

HERZ & CO., 245 W. 55th St., New York
Makers of the HERZ MAGNETO



THE PROVEN TRANSMISSION

**14 Years
of
Satisfaction**



Years of unequalled service to users of
Covert Transmissions has proven the
superiority of Covert construction.

Designed right—built right—by men
who know.

Made in sizes suitable for commercial
vehicles from 500 lbs. to 10,000 lbs.
capacity.

Covert Motor Vehicle Co.

SALES OFFICE
Detroit, Mich.

FACTORY
Lockport, N. Y.

ROWE MOTOR TRUCKS



are used in every line of business and in every case have
proved the most economical means of hauling.


A Rowe Truck will save you money in transporting your
merchandise.

The Rowe Truck is guaranteed to give

Continuous Economical Operation

Worm or chain drive. One to five ton capacity

Rowe Motor Manufacturing Co.
Downingtown, Pa.



BUCKEYE Motor Truck Jacks


Buckeye Motor Truck Jacks are safe, reliable and made to stand the wear and tear for which they are intended. They are fully guaranteed, and cannot possibly drop with a load. They are made from Steel Drop Forgings, best finish and workmanship throughout.

Get our prices before you place your orders for jacks, we can save you money.

| No. | Height Bar Down | Raise ot Bar | Height Bar Up | Weight | Capacity | with formed handle | List Price |
|-----|-----------------------|--------------------|---------------------|----------|------------|-----------------------|---------------|
| 7 | 11 1/4" | 6 1/4" | 18" | 16 lbs. | 2 1/2 tons | | \$10.00 |
| 13 | 14 1/4" | 7 1/4" | 20 1/4" | 26 1/2 " | 3 " | | 15.00 |
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| 9 | 11 1/2" | 6 1/2" | 17 1/2" | 10 " | 1 1/2 " | | 6.00 |

Write today for descriptive catalog. Made only by

THE BUCKEYE JACK MFG. CO., Alliance, Ohio



Republic Mileage

To get mileage you must have quality tires and that is the only kind we make. Of course they cost a little more. That is because they contain the best materials and are the product of the highest skilled workmanship.

One Republic Tire Sells Another

and the man who uses Republics will take pleasure in telling you why. The Republic Staggard Tread is the original non-skid tire just as it is the most effective. Look at the Staggard's patent dates—Sept. 15-22, 1908.

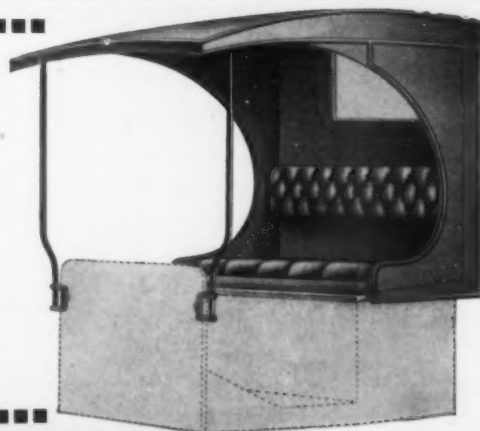
The Republic Rubber Company
YOUNGSTOWN Branches and agencies in all the principal cities. OHIO

Standard Highland Cabs

These cabs are so designed as to fit any truck, and are of the same high quality as the famous Standard Highland Bodies.

We manufacture them in large quantities and, by reason of this, are enabled to market them at a very reasonable price. An ample stock is constantly kept on hand, and orders for immediate shipment are filled without delay. Specifications and prices upon request.

THE HIGHLAND BODY MFG. CO.
Cincinnati, Ohio



FRAMES

THE PARISH & BINGHAM CO.
CLEVELAND, OHIO

FRAMES

**WE HAVE
MADE DURING
JULY, 1912
TO
JULY, 1913
340,890
FRAMES
OF ALL SIZES
FOR 105
CUSTOMERS**

When Writing, Please Say—"Saw Your Ad. in the C C J"

Put a Brake On



Rising Business Expenses

LAST year many of the largest businesses, in spite of an apparently satisfactory increase in volume, found an unsatisfactory profit condition existing. The reason—higher cost of doing business. The remedy—reduction of expenses without decreasing efficiency.

The **INTERNATIONAL MOTOR TRUCK** is built, sold and used to reduce expenses in the delivery and light hauling departments of every kind of business. The recipe is:—One truck for a small business—a fleet of them for a large business.

The **INTERNATIONAL** has a rated capacity of one-half ton. Upkeep expense for this truck is far below that of the horse equipment necessary to do the same work. It varies with conditions and localities, but nowhere is it anywhere near the cost of horse equipment.

Low first cost—low upkeep cost—simplicity and ease of management—dependability—twenty-four hour efficiency—the backing of a responsible company—all these features taken together make the **INTERNATIONAL MOTOR TRUCK** the ideal buy for the business which wants to put an effectual brake on the Rising Cost of Delivery or Service Expense. Write for catalogues and full information. A post card will do.

International Harvester Company of America
(Incorporated)
182 Harvester Building Chicago U S A

Hayes Wheels

Our motor truck department is equipped with the latest improved and specially designed machinery, and with an experienced, capable organization, to turn out the best wheels ever made for motor trucks.

Hayes quality is known from ocean to ocean. **Hayes Wheels** are used, among others, by these leading automobile and truck manufacturers:

Studebaker
Detroit Electric
Garford
Imperial
General Motors Truck
Brown Commercial Car
Chalmers
Columbia
Maxwell
Rambler
Overland
Jackson

Standard Motor Truck
Federal
Speedwell
Cadillac
Sandow
Gramm
Woods
Moon
Regal
Packard
Mogul
Elkhart

SUBMIT YOUR SPECIFICATIONS
TO US FOR QUOTATIONS

HAYES WHEEL CO. :: Jackson, Mich.

GOOD YEAR

AKRON, OHIO

Motor Truck Tires

We make, to supply an immense trade, seven types of motor truck tires—a tire for every service.

Under certain conditions you want **block** tires on rear wheels. Note in Goodyear Block Tires, **each block has its own, individual fastening.** Thus you can remove a single block without disturbing a half dozen others—or more.

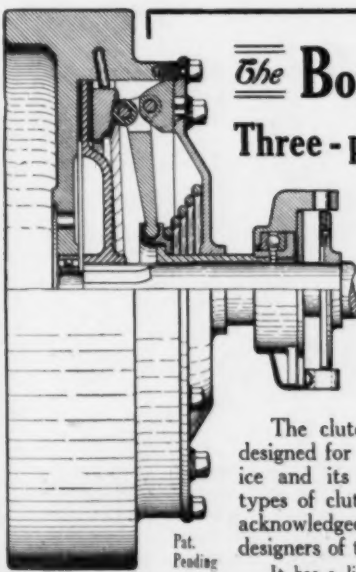
We make a Solid Demountable Tire which is not only marvelously easy to **remove**, but which **can't creep.** This is accomplished by our split ring which automatically adjusts to all irregularities in tire or rims. Has hard metal sub-base, hard rubber base, soft rubber tread. All perfectly unionized. Thus we secure unusual wear at base as well as tread.

The Goodyear Side Flange Quick Detachable is a solid tire for trucks up to two tons. The ever occurring problem of preventing creeping has been completely solved by means of diagonal cross wires in the base. It is never necessary to shellac this tire to the rim.

Our seven Truck Tires are illustrated and completely described in our Motor Truck Tire Catalog.

The Goodyear Tire & Rubber Co.
AKRON, OHIO

Toronto, Canada London, England Mexico City, Mexico
Branches and Agencies in 103 Principal cities.
Write us on Anything You Want in Rubber.



The **Borg & Beck**
Three-plate dry disc
Clutch
offers a real
solution of
the clutch
problem

The clutch has been especially designed for truck and tractor service and its superiority over other types of clutch now in use is freely acknowledged by engineers and designers of the highest standing.

It has a light friction disc that will not manifest any drag in releasing. Its engagement is gradual and positive, and it will not grab, stutter or slip. Does away with gear shifting in crowded traffic by means of friction-slippage. Can be slipped indefinitely without damage.

Truck, tractor and automobile makers are invited to write for complete description.

The Borg & Beck Co.
Moline, Ill.



SIXTY-TWO different manufacturers are now specifying LONG cooling systems.

We have been able to furnish them with exactly the system they wanted and needed.

Our modern factory with its efficient crimping, punching, bending and stamping machinery makes our product **uniformly good.**

We make all kinds of cooling systems—cellular, honeycomb, spiral tube types, for all kinds of cars, trucks and tractors.

Also hoods, radiators and accessory fittings.

We guarantee to solve your cooling problems.

Let our Engineering Department help you.

Long Manufacturing Co.
Detroit Michigan

LONG.



Adams Trucks

"Deliver the Goods"

Greater Values With a Lower Price—One-Ton Chassis \$1850

That the price is lower you will see at a glance.

The increased values are just as easily recognized.

To the thoroughness of Adams' construction, and its marked simplicity of every detail affecting its control and maintenance, we have added these important features:

Continental Motors are now used exclusively on all Adams Models.

Timken Axles and Bearings are used throughout.

Bodies are built, of course, for any trade, on 1, 1½ or 2 ton chassis. Adams Trucks are standardized for more than one hundred different lines of business.

We want to hear from wide-awake dealers in unoccupied territory. Write today.

THE ADAMS BROS. COMPANY
438 West Main Cross :: Findlay, Ohio

First American Truck Manufacturers to use the French type of hood; with radiator at rear of motor. Bodies made in all styles, to suit any industry.

Worcester Presteel

Rear Axle Housings
Ball Cups
Segments
Shims
Hub aps
Hub Flanges



Brake Drums
Brake Guides
Quadrants
Wrenches
Covers
Joint Cases

For Commercial Cars and Automobiles

We specialize in cold hollow drawing, pressing, forming, colning, punching and stamping parts for motorcycles, bicycles, cream separators, textile and electrical machinery, and for other purposes, to order.

In steel, brass, copper, aluminum, monel metal and other sheet metal alloys.

Worcester Pressed Steel Company

Main Office and Factory

Worcester : Massachusetts

San Francisco Office, 333 Rialto Building
Portland, Oregon Office, 520 Swetland Building
Chicago Office, 1243 Peoples Gas Building
Detroit Office, 1417 Ford Building
Philadelphia Office, 418 Land Title Building
New York Office, 154 Nassau Street



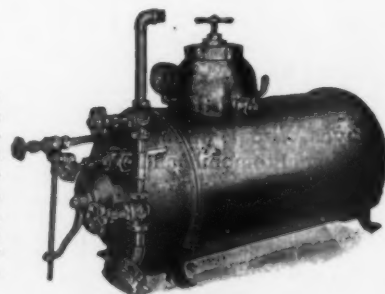
3-Gallon Approved Extinguisher

Chemical Fire Apparatus

HAND EXTINGUISHERS and TANKS

of every description for department apparatus. We are equipped to make tanks of any size or type.

We also provide a complete line of Chemical Engines, mounted on wheels for service in factories, towns, villages, etc. Hose Reels, Hose Axles, Ladders, Hooks, etc.



35-Gallon Copper Tank



We can equip any chassis complete with body, chemical apparatus, etc. **Ask us.**

O. J. CHILDS CO.

48 Liberty Street
UTICA, N. Y.



Crown Worm-Drive Motor Trucks

1 Ton--1½ Ton--2½ Ton

A COMPLETE SELLING LINE OF
DEPENDABLE TRUCKS

Responsible, energetic dealers are invited to correspond with us at once. We seek a few more selling representatives—live ones—those who recognize merit and desire to connect with a dependable, lasting and efficient selling proposition.

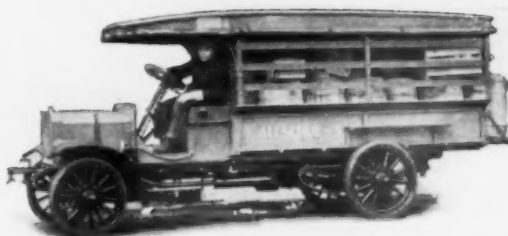
Crown Worm-Driven Trucks Stand Supreme

Send for complete catalog, terms and detailed information. Write today.

CROWN COMMERCIAL CAR CO.

Milwaukee, Wis., U. S. A.

Factories: North Milwaukee, Wis.



When It's a Question of Time

either time saved in ordinary delivery, or special delivery, when you must get there in a hurry, the machine that is always ready, and can get there with the least delay, has a big advantage.

Many different firms and in many different lines of business, are finding that

B. A. Gramm's Trucks

are always ready, under all conditions.

There are good reasons for this; for example, the electric starting outfit, the individual clutch transmission, etc.

These and many others make B. A. Gramm's Truck one which gives its owners a service that is out of the ordinary.

Let us tell you about it and the reason for its being so.

The Gramm-Bernstein Company
Department 1 Lima, Ohio, U. S. A.

The Motsinger Carburetor



on a motor car or truck avoids the delay caused by fussing with the many adjustments of the ordinary carburetor.

It is simple—ready when installed.

No changing springs, needles or nozzles. The one adjustment is on the steering post.

Put
one
on
your
car or
truck



**Motsinger
Device Mfg. Co.**

965 Miami St.

LAFAYETTE
INDIANA

Stewart Delivery Trucks

Consider This Remarkable Record

1. We sell more Stewart trucks today than any other exclusive builder of 1500-pound delivery trucks.
2. A big percentage of our business consists of repeat orders.
3. No purchaser of a Stewart truck has ever subsequently bought any other 1500-pound truck but the Stewart.
4. We haven't a single dissatisfied owner.

Write us for further information about the Stewart opportunity to dealers.

Stewart Motor Corporation, Buffalo, N. Y.

T. R. Lippard, Pres. and Gen'l Mgr. R. G. Stewart, Vice-Pres. and Chf. Eng.
R. P. Lentz, Sec. and Treas.

Commerce Delivery Car

will give you a twelve months' profitable business and a twelve months' success.

If you are in the automobile business for steady, consistent growth and permanent, legitimate profits, write or wire for details.

**THE COMMERCE
MOTOR CAR CO.**

Detroit :: Michigan

DeKalb TRUCKS

**are money-makers for dealers, because
they are money-earners for users**

These brief specifications tell in part why the DeKalb makes good—Timken Axles, front and rear; Continental Motor; Bosch Magneto; Stromberg Carburetor; Pressed-Steel Frame; Three-Point Suspension on Motor and Transmission; Selective Sliding-Gear Transmission; Non-Reversible Worm-gear Steering Gear; Left Drive; Center Control; Two-Ton Capacity; Special Type Cone Clutch, etc.

The DeKalb is the truck for you if you want to handle a high-class, heavy-duty truck, correctly designed and built, of unquestioned worth and backed up by a company of long standing, financial responsibility and unblemished reputation.

More Dealers Wanted

Our agency proposition, like the DeKalb Truck, is attractive because it's right

DeKalb Wagon Co., DeKalb, Ill.

Chicago Sales Office: 1532 Michigan Ave.

YOU KNOW

that your truck, when in operation on the street, is the best kind of advertisement for your business.

DO YOU KNOW

that the body which your truck carries is the first feature to attract the attention of the public?

WE ALL KNOW

that LITTLEFORD ALL-STEEL TRUCK BODIES are the best. They are more durable, more practical, more attractive and more in keeping with a good, strong machine than any other kind.

THEY ARE
THERE FOR WEAR

**LITTLEFORD
ALL-STEEL
TRUCK BODIES**
MADE TO SUIT YOUR
REQUIREMENTS



SEND US
YOUR SPECIFICATIONS
AND SIZES. WE WILL QUOTE YOU ATTRACTIVE PRICES
LITTLEFORD BROS., 453 E. Pearl St., CINCINNATI, O.

Chilton Advertising Post Cards

**in colors should be included
in every advertising campaign**

Your prospective customer *may* see your catalog or magazine advertisement, but he is sure to read your CHILTON POST CARD.

The use of the post card in colors is the modern way to advertise and economize. It is a *personal-appeal* form of publicity which invariably attracts attention, and is sure to land orders.

Forward us your printed matter, state what you want to advertise and how many cards you can use, and we will do the rest.

CHILTON COMPANY

Market and 49th Streets

PHILADELPHIA, PA.

One Firm—One Service—One Guarantee back of every Johns-Manville Automobile Accessory



Long Horn

Positively cannot fail. Offers absolute reliability plus certain economy. Utilizes no batteries or wires—operated instead by hand or elbow. Produces powerful warning, dominant above all other noises, with volume of sound under operator's complete control. Handsome in appearance and built to last. First cost its only cost—price \$10.



J-M (Mezger) Soot-Proof Spark Plug

Eliminates short-circuits—cleans itself. Insures the maximum spark for ignition. The porcelain petticoat, becoming intensely hot, burns off all deposits of carbon. Absolutely guaranteed not to leak.



J-M Non-Burn Brake Lining

Grips drum instantly, tightly and noiselessly. Positively unaffected by heat. Impervious to water, oil or gasoline. Now supplied in strips to fit any make of car and conveniently packed in cartons, with rivets for attaching. Equally well adapted to internal or external brakes.

COVERS THE CONTINENT

THE H. W. Johns-Manville Company are the first to offer to users of automobile accessories the protection afforded by a standardized Service and Guarantee on accessories of standardized quality.

The purchaser of any Johns-Manville accessory is protected by the reputation and financial stability of the H. W. Johns-Manville Company, whose liberal guarantee is standard on every article sold over its name.

He is protected by the Service which this company renders through its wide distribution of direct representatives and its Branch Houses in every important city of North America.

He is still further protected in buying accessories that have received the authoritative endorsement of the H. W. Johns-Manville Company as products of proven excellence.

Complete Johns-Manville equipment is the strongest possible guarantee of complete satisfaction.

A Few Other Johns-Manville Automobile Accessories

Arnold Electric Vaporizer

G-P Muffler Cut-Out

"Noark" Enclosed Fuses

J-M Mobilite Electric Lamps

Arnold Electric Heating Plugs

J-M Fire Extinguisher

Write nearest Branch for booklets

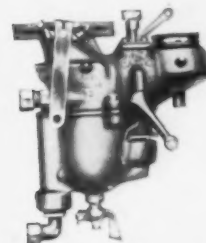


Jones Recorder

Renders a detailed daily report of your truck's operation. Shows starting time, stopping time, duration of each stop, and speed at all times. Detects careless driving. Impossible to tamper with—record made within locked case. Provides accurate means for figuring truck costs and determining driver's efficiency.

J-M Dry Batteries

The most efficient and lasting batteries for all ignition purposes. Sold with the guarantee, that should they not prove entirely satisfactory, we will replace same with new batteries without cost, or refund purchase price, including transportation charges. Made in two shapes, round and square.



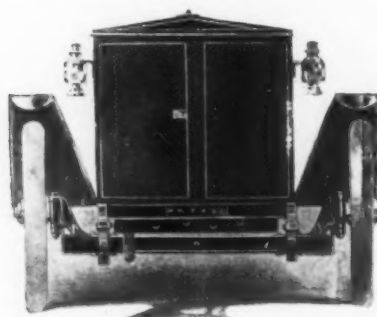
Carter Carburetor

Multiple-Jet principle. Number of jets in action depends on variation of fuel level in jet tube, which is controlled directly by suction of engine. Insures absolutely progressive flow of fuel. Responds instantly to every change of engine speed. Promotes wonderfully increased flexibility, economy and power.

H. W. JOHNS-MANVILLE CO.

Akron Birmingham Chicago Dallas Duluth Indianapolis Memphis New Orleans Pittsburgh St. Paul Seattle Washington
Albany Boston Cincinnati Dayton Galveston Kansas City Milwaukee New York Portland, Ore. Salt Lake City Syracuse Wilkes-Barre
Atlanta Buffalo Cleveland Denver Houghton Los Angeles Minneapolis Omaha Rochester San Francisco Toledo Youngstown
Baltimore Charlotte Columbus Detroit Houston Louisville Newark, N. J. Philadelphia St. Louis
THE CANADIAN H. W. JOHNS-MANVILLE COMPANY, Ltd., Toronto, Montreal, Winnipeg, Vancouver

When Writing, Please Say—"Saw Your Ad. in the C C J"



Here is a Practical Solution of the Problem of Making Economical Deliveries of Packages—the



Commercial Car

The merchants in Philadelphia have known the Light Commercial Car used by the Quick Delivery Company for the past eight years. They know the work it has done and the satisfactory and economical manner in which it has handled their deliveries.

The Light Commercial Car was developed in this delivery service.

Some of the special features of the Light Commercial Car are: Its first cost, small operating expense, light in weight, easily operated, quick in making deliveries, and has the ability to cover large areas in widely scattered points at a slight cost. Its construction is simplicity personified, and gives reliability of service

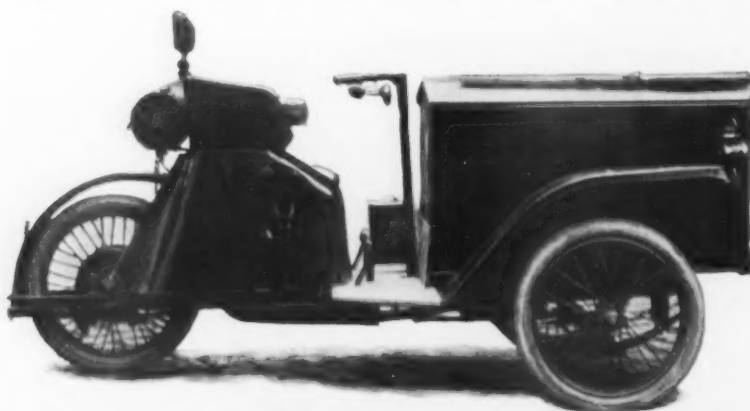
at a nominal cost for repairs; all these points are vital to the merchant's delivery system.

Eighty-five per cent of all local package transportation can be handled by the Light Commercial Car. It weighs 600 lbs., carries 800 lbs; it goes 35 miles an hour, and 40 miles on the gallon; it is designed to meet the needs of the merchant.

It sells for \$475.

The man who sells the "LIGHT" has a proposition that will make money for him, for almost every merchant is a good prospect. His investment is small, and repeat orders are certain to come, for the car will quickly prove its worth and economy.

Wayne Light Commercial Car Co., Inc. 1790 BROADWAY
NEW YORK CITY



When Writing, Please Say—"Saw Your Ad. in the C C J"

SCHWARZ WHEELS



The Safety Factor

The plea of "Safety First" is being urged broadcast throughout the land and in all manner of industries. It is an appeal for human lives by giving the safety factor greater prominence than price or any other element.

Nowhere has it greater force than in the automobile industry, and in no part of an automobile or truck does it deserve greater consideration than in the wheels. These are the burden bearers and any weakness in them is a direct invitation to disaster.

Many car builders recognized this long ago and made safety an assurance by putting SCHWARZ WHEELS on their cars. As time proved that the SCHWARZ method of construction *did* provide greater strength and safety than any other method, other manufacturers followed their lead, until today, nearly all the leading pleasure cars and trucks have SCHWARZ WHEELS.

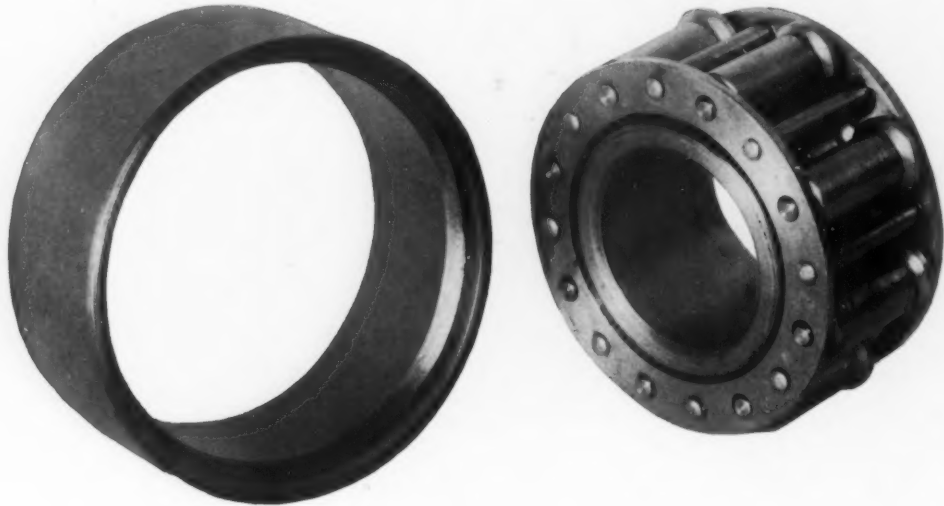
The grooved and mortised spokes, dovetailing and interlocking, form a rigid and immovable center assembly which cannot loosen, work apart or get out of true. Therein SCHWARZ WHEELS differ from all others. If you consider "Safety First" in the building of your cars, you must inevitably choose SCHWARZ WHEELS, because the experience of many builders has conclusively proved them to excel in strength, safety and economy.

The Schwarz Wheel Company

Frankford, Philadelphia, Pennsylvania

When Writing, Please Say—"Saw Your Ad. in the C C J"

"BOWER SAVES POWER"



The Raceways

The fact that Bower Raceways are parallel at all points is of profound significance. For this reason the load is borne evenly by the roller along its entire length, and also for this reason the load produces no end-thrust.

Again, the rollers are self-aligning, never binding or slipping endways. Finally, the parallel position of the raceways obviates troublesome adjustments in Bower Roller Bearings.

Notice: *The Bower Roller Bearing is patented in the United States and foreign countries. INFRINGERS of our patent right to MAKE, USE, VEND or SELL will be duly prosecuted.*

BOWER ROLLER BEARING COMPANY
Detroit, Michigan

When Writing, Please Say—"Saw Your Ad. in the C C J"



Delivering oil—

This 4-ton Mack is used by The Texas Company to deliver its product to the supply stations in Denver.

It is exclusively equipped with

GOODRICH WIRELESS TRUCK TIRES

The Texas Company is highly satisfied with the continuous service rendered by Goodrich Wireless Tires. This set was put on December, 1912, and on January 24, 1914, they had run 8,500 miles and were still in excellent condition.

**What Goodrich Wireless Tires are doing for The
Texas Company they will do for you**

The B. F. Goodrich Company

Factories:
Akron, Ohio

Branches in All
Principal Cities



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Bearing Metals and Gear Bronzes

In the world's great engineering feats, where millions upon millions of dollars are involved, there is no such thing as a compromise on the material employed. The specifications invariably read—

"Cramp Bearing Metals and Gear Bronzes"

This fact is highly significant and a fitting tribute to the quality of CRAMP products. For years they have held the preference of the most renowned engineers.

When the United States Government designed the stupendous Panama Lock Gates, requiring enormous gearing and bearings, it unhesitatingly specified **CRAMP METALS**.

The best motor cars and trucks, those famed for their sturdiness and long service, boast the **CRAMP METALS**.

The World's greatest battleships have spread the fame of **CRAMP METALS** world wide. The high standard of precision, accuracy and quality set in these battleships is not approached in any other engineering feats.

Everywhere and every day **CRAMP METALS** become a part of some great commercial enterprise, simply because their quality is known. Why experiment? Specify—

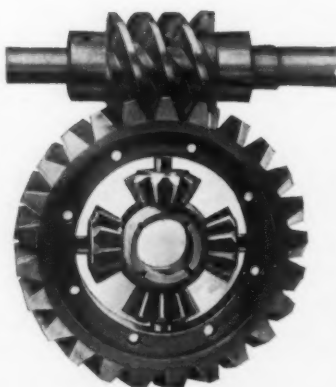
CRAMP

Every nation on the face of the entire globe has endorsed **CRAMP METALS**.

We have been making **WORMGEARS** for over sixty years—our first gears are still in service. This **WORM-GEAR** knowledge, backed by a hundred years of experience in manufacturing metals, guarantees the **CAR MANUFACTURER** a feature, the prestige of which alone will increase his sales and put his car in the limelight of the buying public.

Write us about it.

There is no necessity of your importing metals, it costs you time and money. The very metals you would import are those that have been discarded in foreign countries in favor of **CRAMP METALS**.



The William
Cramp & Sons
Ship & Engine
Building Co.

Philadelphia
Pennsylvania

When Writing, Please Say—"Saw your Ad. in the C C J"



\$15

Complete
With Hub-Cap
to fit any Make
of Truck

The Biggest Factor In Motor Truck Operation

IT is not enough just to buy trucks and put them to work. That is only the *start*. The biggest factor in successful motor truck operation is in having precise, reliable and complete information as to what your trucks are doing. How many *miles* per day? How many *miles* per gallon? How many *miles* per tire? How many *miles* per *dollar*? This you learn from having

A Stewart Hub Odometer

on every Truck you are running

Do not consider getting this vital information from a less dependable instrument. The Stewart Hub Odometer *cannot* mislead or misinform you.

Its drive does not consist of thin metal discs, but of steel pinions with worm and spiral gears. Each pinion is machined from a single piece of steel, heat treated and hardened to resist wear. The dials are controlled by our Geneva Stop mechanism, which locks each dial except at the instant of registering. Those not registering remain securely locked. And it has no trouble-making springs, pawls and ratchets.

It is impossible for the Stewart Hub Odo-

meter to fail to register correctly. It is impossible for mud, water or oil to get into the Stewart Hub Odometer. Of no other like instrument can this be truthfully said. The Stewart is the only Hub Odometer that cannot suffer through internal or external causes of any kind.

Operate your motor trucks *intelligently*, with full knowledge of what they *are* doing and *can* do. Learn this by attaching a Stewart Hub Odometer to each truck you have. Insist on having a Stewart Hub Odometer on each new truck you buy. It will be supplied if you insist.

Stewart-Warner Speedometer Corporation

Factories: Chicago, Ill., and Beloit, Wis.

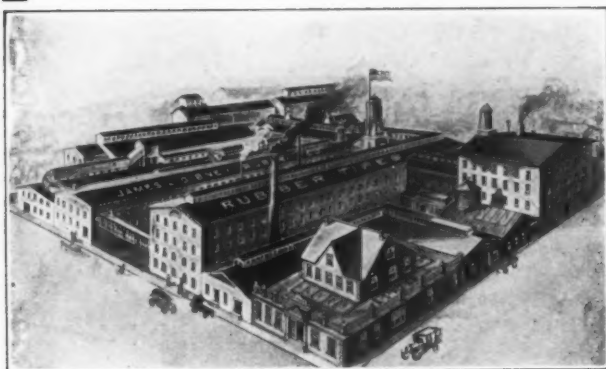
1976 Diversey Blvd., Chicago

17 Branches and Service Stations in all cities and large towns

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GIBNEY WIRELESS TIRES



FACTORY: CONSHOHOCKEN, PA.

These are the original wireless tires—the ones whose phenomenal success has caused a host of imitators to spring up. They are the tires that proved the wireless principle was the right one for commercial vehicle use; the tires whose supremacy has been proved in the severe tests of actual service; the tires which have established records that others have been unable to equal. They are the tires which discriminating buyers insist upon having, for they are

THREE YEARS AHEAD

The first to be conceived, worked out and put in use, they had a three years' leadership over all other makes, which they have ever continued to maintain.

There is good money in an exclusive agency for GIBNEY WIRELESS TIRES. If you are a live, energetic dealer wishing to make money with a high-class, dependable tire of proved merit, it will pay you to write for our exclusive agency proposition.



GIBNEY
Tire & Rubber Co.
Philadelphia Baltimore
New York Boston
Washington Minneapolis
St. Louis Detroit

When Writing, Please Say—"Saw Your Ad. in the C C J"

Take Philadelphia for Instance—



This photograph was taken in the Shipping Department of the brewery of F. A. Poth & Sons, Philadelphia. This company has 39 electric trucks, 21 of which are equipped with "Ironclad-Exide" Batteries and two with "Exide" Batteries.

The Philadelphia Electric Co. operates a fleet of 44 electric delivery wagons and trucks, 23 of which are equipped with "Ironclad-Exide" and 21 with "Exide" Batteries.

The Bergdoll Brewing Co. has 14 electric trucks, and C. Schmidt & Sons Brewing Co. of Philadelphia, 10 electric trucks; equipped with batteries of the "Exide" types.

John Wanamaker, Strawbridge & Clothier and Gimbel Bros., the three largest department stores in Philadelphia, have 12 electric vehicles, 11 of which are equipped with batteries of the "Exide" types.

The Curtis Publishing Co., publisher of the "Ladies' Home Journal" and the "Saturday Evening Post," uses "Ironclad-Exide" Batteries, having 12 electric trucks equipped with them.

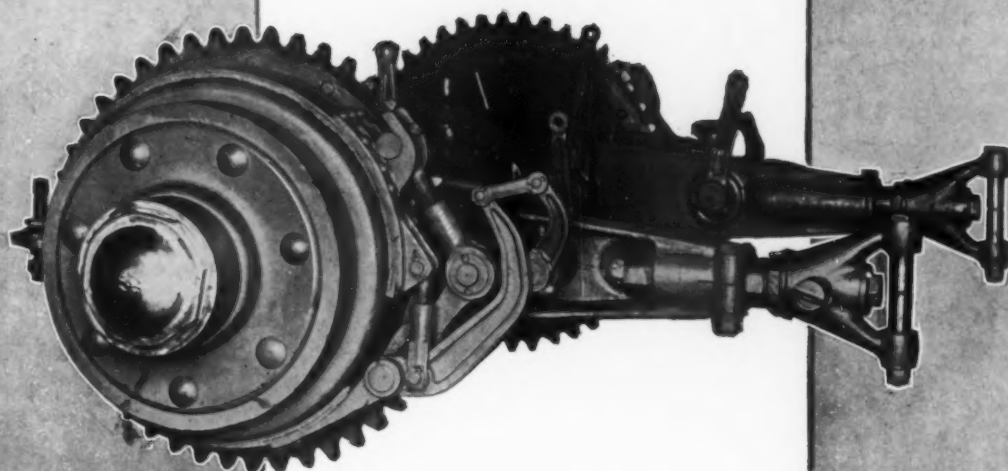
The Union Transfer Co., The United Gas Improvement Co., and the Finkenauer Brewing Co., are other large users of "Electrics" in Philadelphia, using batteries of the "Exide" types.

Philadelphia has hundreds of other electric vehicle users,—both commercial and pleasure—who have equipped their cars with either "Exide", "Hycap-Exide", "Tbin-Exide" or "Ironclad-Exide" Batteries.

Let us refer you to the owners of "Electrics" in your town who are using "Exide" Batteries, and let us help you in choosing the proper battery for your service.

THE ELECTRIC STORAGE BATTERY CO.

Manufacturer of The "Chloride Accumulator," The "Tudor Accumulator,"
The "Exide," "Hycap-Exide," "Tbin-Exide," and "Ironclad-Exide" Batteries.
New York Boston Chicago PHILADELPHIA, PA. Denver San Francisco Seattle
St. Louis Cleveland Atlanta Detroit 1888-1914 Los Angeles Portland, Ore. Toronto
886 "Exide" Distributors 9 "Exide" Depots "Exide" Inspection Corps



The **BRAKES BELONG** *on the* **WHEELS-NOT** *on the* **JACK-SHAFT**

Sheldon Double-Brakes-On-The-Rear-Wheels

Has sounded the death-knell of the jackshaft method of braking. It spells finality as to the location of the brakes because it puts them in the only logically correct position—ON THE WHEELS.

SHELDON EQUIPMENT gives you two sets of brakes on the rear wheels. There is always certainty as to the braking efficiency—which is not true of jackshaft brakes. Suppose with your present method, the chains should "jump off" at the critical moment? Could you depend on your single set of rear wheel brakes skidding the wheels?

Take our 3-ton equipment as an efficient example. The outside brake is of the wrap-up type acting on the 18-in. by 3-in. pressed steel drum. The inside brake is of the self-intensifying type. Either brake will skid the wheels. You can take your choice of foot or hand brake. There is a braking surface of 500 square inches. To stop a 3-ton truck with 50 per cent overload means applying only 200 pounds pressure per square inch to the braking surfaces. On many trucks the pressure runs as high as 700 pounds per square inch. The self-intensifying feature of Sheldon Brakes gives a uniform pressure on the whole surface of the drum. This is not the case with any other type of brake.

Can you wonder that ordinary brakes fail to hold at the critical moment?

IN A YEAR OR TWO EVERY HIGH-GRADE TRUCK WILL BE EQUIPPED WITH BRAKES ON THE REAR WHEELS. JACKSHAFT BRAKES ARE ALREADY DOOMED! THE LEADING TRUCKS ARE COMING TO DOUBLE-BRAKE REAR WHEEL EQUIPMENT.

Why not make your truck one of the leaders? It'll be a selling point in your favor.

Write us for information on this subject—today.

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

Chicago Office:
68 E. 12th St.

San Francisco Office:
444 Market Street

Detroit Office:
1215 Woodward Avenue



Steinmetz Says:

"I believe that the Electric will be the car of the future on account of its simplicity of operation and reliability. It is rare that it gets out of order. When it does so it is an accident—not as with the gasoline car, an incident. The man of moderate means cannot afford a horse and buggy because of the attention required. He will be able to afford an Electric Vehicle to take him to business because it requires no attention—if equipped with an *Edison* Battery. It often has to stand idle for several days and this is not good for a lead battery. I have tried to invent a lead battery that would not spoil, but leave it up."

From an Approved Report of Some Extemporaneous Remarks of Dr. Chas. P. Steinmetz at a Recent Meeting of Engineers.



EDISON STORAGE BATTERY COMPANY

141 Lakeside Avenue, Orange, N. J.

The Edison Nickel-Iron-Alkaline Storage Battery is the **Only One**
that Contains no Lead nor Acid



\$635 F.O.B.
Phila.

**Low in Price
High in Quality**

You Can Sell This Car



**because it is the kind
that merchants want**

When we say "You can sell this car" we don't mean an occasional one, but selling on a large scale and making profits such as dealers dream of, but seldom realize.

It's all because most merchants have at last realized that *big* trucks are too costly for them to operate and maintain. They consequently are demanding a strong, small, light car, low in initial cost, inexpensive to operate and maintain and which affords quick, economical delivery service.

The VIM meets that demand. It is to the commercial car field what the Ford is to the pleasure car end.

A Harvest for Dealers

Here is a big opportunity for one dealer in every locality. The demand for this car does not have to be cultivated—it already exists, but the VIM is the only car that fully meets the requirements. It is a real automobile, not a makeshift or a cyclecar. It is sturdy, rugged, practical, economical.

Scores of dealers realized this and their applications for agencies are pouring in. They *know* they can sell the VIM, because it is what their customers want. How about your territory—will it be you or some competitor?

VIM SPECIFICATIONS

Engine—Northway light truck motor, 3" bore, 4½" stroke, four cylinders, water cooled thermo-syphon mechanically operated valves enclosed. Motor cast en bloc; crank shaft diameter 2"; three main bearings.

Horse Power—15-20

Clutch—Leather-faced cone, 12" diameter, 2½" face; designed for 30 h. p. loading, thus qualifying for abuses attending commercial service.

Transmission—Three-speed and reverse selective sliding gears, ¾" face, six and eight pitch; shafts all of chrome nickel alloy, mounted on imported annular bearings, mounted as unit with motor.

Lubrication—Positive force feed and splash; capacity 2 gallons, sufficient for 600 miles.

Ignition—Atwater Kent Multi-Sparker, enabling easy starting and economy.

Control—Left-hand drive, right-hand control for gear shift and emergency brake.

Brakes—Contracting on rear wheel drums for service, internal expanding on rear wheel drums for emergency; 10" diameter, 2¼" wide and Raybestos-faced. Both brakes equalized.

Axles—Front axle special drop forged steel in one-piece, I-beam section; knuckles and steering arms are drop forged and heat-treated. Rear axle full floating, equipped with Brown-Lipe differential of alloy steel; drive shaft 1 1-8" diameter.

Wheels—12 spoke, 1¼" size of spoke, Schwab Artillery wheels, equipped with rims for 30 x 3 and 3½" tires.

Wheelbase—59", tread 56", angle of steering 35°.

Gasoline Tank—Located under seat; 7 gallon capacity; conveniently arranged for filling.

Springs—Semi-elliptic front and rear; special heat-treated steel, 2" wide.

Weight—1575 pounds.

Body—Steel body, all joints welded, providing an endless steel frame without joints whatsoever, making the most substantial body to build. Inside loading measurements, 56" long, 54" high, 42" wide.

Finish—French Gray with Monitor Gray mouldings.

Speed—2 to 25 miles per hour.

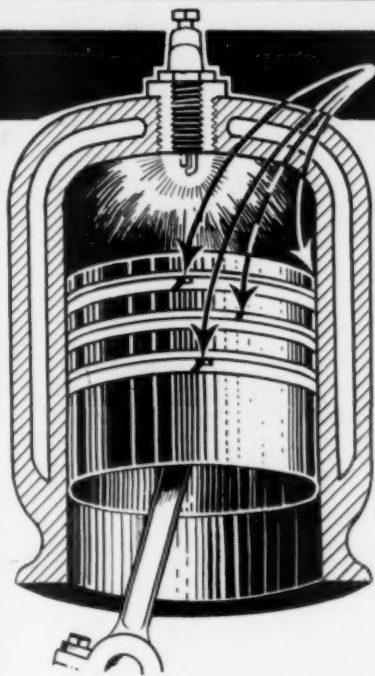
Frame—Pressed steel channel, depth, 3½".

THE TOURAINE COMPANY, Broad and Huntingdon Sts., Philadelphia, Pa.
MAKERS OF THE TOURAINE SIX PLEASURE CARS

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Gas Cannot Escape Here

if your engine is equipped with

TRADE-MARK REGISTERED



PATENTED

Piston Rings

This is a mighty important factor in the cost of operating motor trucks, even though it may seem like a little thing. When the old-style piston rings are used gas does escape, under compression, through the openings in the rings and down the sides of the cylinder walls, owing to the rings' imperfect bearing. This results in loss of fuel, decreased power, impaired efficiency and increased operating cost.

This is avoided in **LEAK-PROOF** RINGS, because they are made in two pieces, each section carrying a right-angle flange covering the opening in the other piece. Their construction insures perfect bearing on cylinder walls. This prevents gas escaping and consequently increases power and efficiency and decreases the cost of operation. Little things like this frequently make the operation of trucks profitable or unprofitable. If you have any doubt **"ASK THE USER"** as to whether **LEAK-PROOF** RINGS will save you money.

McQUAY-NORRIS MFG. CO., Dept. C

1309 CHESTNUT ST.

NEW YORK, N. Y.
Room 33, Lincoln Sq. Court
64th and Broadway

BRANCH OFFICES:

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Suite 718-719 Michigan
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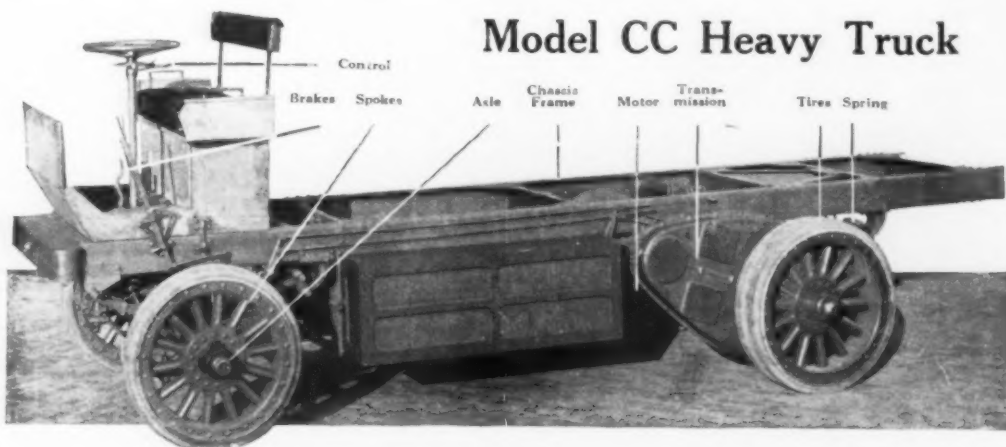
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Model CC Heavy Truck

EIGHT POINTS OF SUPERIORITY IN

Baker Electric Trucks



DOUBLE BRAKES: Afford extra safety in controlling heavy loads on hills. Joints bronze bushed; shoes asbestos lined.

PRESSED STEEL CHASSIS FRAME: Light and strong; standard touring car construction, of heavier weight.

300% OVERLOAD CAPACITY MOTOR: Won't burn out. Extra wide driving chain runs, with oil bath, in cast aluminum box.

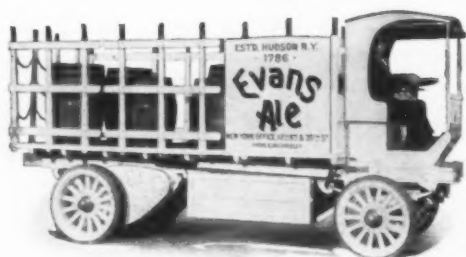
CONTROL LEVER JUST UNDER STEERING WHEEL: Enables driver to keep both hands on wheel all the time.

EXTRA EQUIPMENT INCLUDED: Volt ammeter or ampere hour meter, hub or dash odometer, electric bell or horn, without charge.

SPRINGS EXTRA TOUGH: Will not break or crack, designed for 50% overload. Spring end and bracket bronze bushed.

LOCKED SPOKE WHEELS: Strength saves breaks in skidding. Tires all extra size.

FRONT AND REAR AXLES: Unusually strong. Tough steel drop forgings. Spring supports forged to axle.



Some Baker advantages may be found in other trucks, but not all of them in any single make. Let us send you a complete and detailed description of Baker Electric Truck construction, to compare with regular specifications of any other electric.

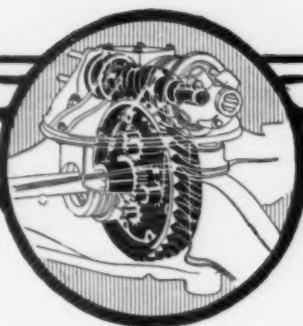


THE BAKER MOTOR VEHICLE CO., CLEVELAND



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THE PIERCE-ARROW



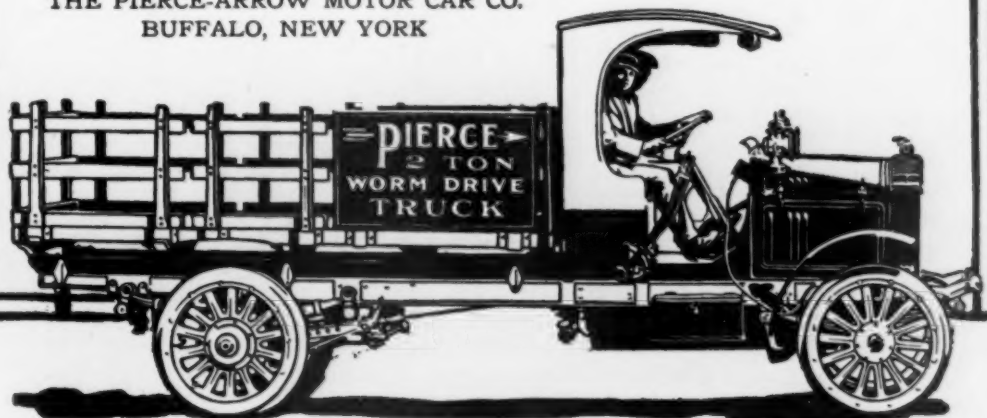
WORM GEAR DRIVE

THE Pierce-Arrow

5-Ton and 2-Ton Trucks

It has been frequently demonstrated that under some conditions our trucks can work a tremendous saving over horse-drawn vehicles. Certain other conditions have been found by us to be impractical for the use of trucks. We are always ready to undertake an inquiry that will settle the question without bias. Our permanent welfare could be served in no other way.

THE PIERCE-ARROW MOTOR CAR CO.
BUFFALO, NEW YORK



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Packard Adopts

HIGH SPEED
NON-GRAN
BEARING BRONZE

For Twenty-one Bearing and Bushing Parts At an Increase to Its Manufacturing Cost on Each Car

That is the answer to the tests which the Packard Motor Car Company has been conducting since October, 1912.

NON-GRAN is the only bearing bronze which has ever proved superior to the Packard Company's own product.

It takes a long time to "test to a finish" and prove relative values, but once this is done—far-sighted Manufacturers, whether of high, medium or low price machines, are quick to adopt the BEST for the VITAL parts that take the WEAR. As a result of this policy their machines, by giving far longer satisfaction to the user, increase in value out of all proportion to the little they add to their cost.

NON-GRAN Insures Added Commercial Success at a Trifling Cost
We Quote Promptly, Deliver on Time, and Guarantee Uniformity

NON-GRAN Castings

NON-GRAN Finished Bushings

AMERICAN BRONZE COMPANY

440-480 Chester Boulevard

Berwyn, Pennsylvania